ZETRON

Model 4010 Radio Dispatch Console
Service Manual

Part No. 025-9228H

FEDERAL COMMUNICATIONS COMMISSION (FCC) REGULATIONS

Part 68

1. This device complies with Part 68 of the FCC rules. The FCC registration number of this device and the ringer equivalence number, if requested, must be reported to the telephone company. The FCC registration number and the ringer equivalence number may be found on the label attached to any of the Model 4010 phone patch cards installed in the unit.
2. The ringer equivalence number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. The sum of ringer equivalence numbers for all devices connected to a single telephone line should not exceed five (5.0) for reliable operation. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.
3. If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify you as soon as possible. You will also be advised of your right to file a complaint with the FCC if you believe it is necessary.
4. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
5. This device must not be installed on coin-operated telephone lines or party lines.
6. Repair work on this device must be done by Zetron, Inc. or a Zetron authorized repair station. If this device is causing harm to the telephone network the telephone company may request that you disconnect the equipment until the problem is resolved.

Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Changes or modifications not expressly approved by the manager of Zetron's compliance department can void the FCC authorization to operate this equipment.

Repair work on this device must be done by Zetron, Inc. or a Zetron authorized repair station.

WARRANTY

Zetron's warranty is published in the current Zetron *United States Price Book*.

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TRADEMARKS

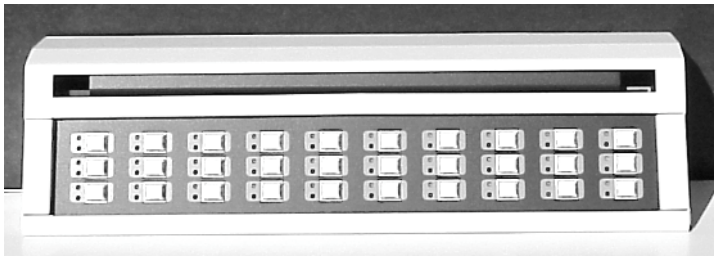
Table of Contents

INTRODUCTION

MODEL 4010

The Model 4010 Radio Dispatch Console is a self-contained, multi-channel, desktop console. It is a single position console that interfaces directly to the radio transceivers and telephone lines. It is suitable for use in public safety applications, such as police and fire communications, as well as public service applications, such as utility and industrial communications. The Model 4010 may be tailored to fit the size of the system, from 2 to 12 channels, by adding dual channel cards as required. The channels can be configured to support a mix of control types: DC remote, tone remote, local control, and E&M control.

MODEL 4011



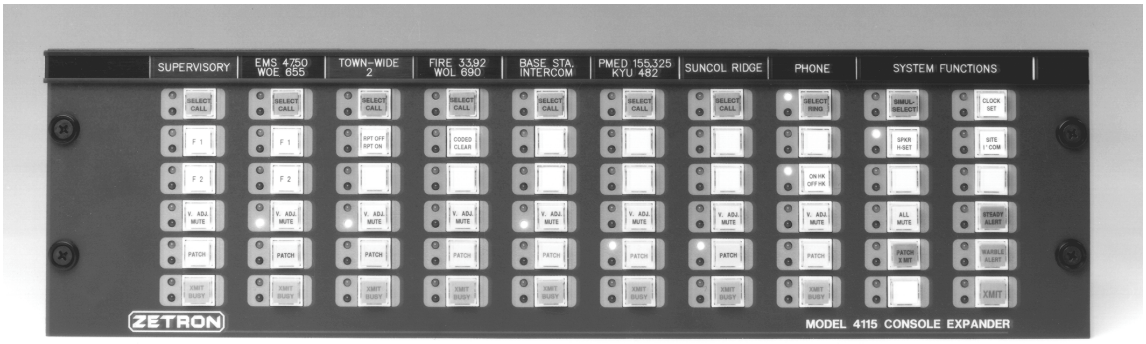
The Model 4011 Console Expander attaches to the top of desktop console and adds 30 programmable keys to the station.

MODEL 4010R

The Model 4010R Radio Dispatch Console has the same electrical functions and capabilities as the Model 4010. However, it is designed to mount in a standard 19" equipment rack and takes up 6U (10.5 Inches) of vertical space.

In this manual both the Model 4010 and 4010R are referred to as the Model 4010 unless specifically stated otherwise.

MODEL 4115B



The Model 4115B Console Expander is a rackmount 60-button panel used to expand the number of programmable keys available to the Model 4010R.

MANUALS

Several manuals describe the operation, installation, service and programming of the Model 4010 Radio Dispatch Console. This manual includes the parts lists, schematics, and silkscreens for the Model 4010. Below is a list of the Model 4010 manuals and a description of their contents.

Manual Title	Zetron Part No.	Description
Operator's Manual	025-9226	Presents an overview of the console panels, a description of the functions of each button, and a detailed description of the Model 4010.
Installation Manual	025-9227	Presents a description of how to configure and install the model 4010 console and accessories.
Service Manual	025-9228	Presents the parts lists, schematic drawings, and silkscreens for the Model 4010.
Programming Manual	025-9229	Describes how to use the Console Programming System (CPS) to program the console keys.

SPECIFICATIONS

PHYSICAL SPECIFICATIONS

Model 4010	
Size	height = 9″ x width = 18″ x depth = 14″
Weight	15 pounds
Model 4010R	
Size	height = 10.5″ x width = 19″ x depth = 10.5″
Weight	15 pounds
Model 4115B	
Size	height = 5.25″ x width = 19″ x depth = 2.25″
Weight	4 pounds

TELEPHONE INTERFACE SPECIFICATIONS

Lines	Two end-to-end lines
Connector	RJ11 modular jack
Incoming Call	Ring detection on tip and ring pair
Call Answer	Off-hook, tip and ring current draw
Ringer Equivalency	1.2 B

TRANSMIT ELECTRICAL SPECIFICATIONS

Audio Output	+10 dBm max. into 600Ω
Output Impedance	Transmit: 600Ω balanced Idle: 600Ω or 3500Ω
Distortion	< 2% at full output. Signal-to-Noise > 50 dB Hum, Cross-Talk all -50 dB at full output
Microphone Input	-65 dBm for full output
Headset Input	-20 dBm for full output
Page/Spare Input	-15 dBm, not compressed
Freq. Response	-3 to +1 dB from 250 Hz to 5000 Hz
Compression	Input level increase of 30 dB above the knee of compression causes < 3 dB output increase

RECEIVE ELECTRICAL SPECIFICATIONS

Input Impedance	600 or 10 kΩ for 4-wire 3500 Ω for 2-wire
Line Balance	66 dB at 1000 Hz
Rx Sensitivity	-30 dBm max at knee of compression; adjustable
Freq. Response	-3 to +1 dB from 250-5000 Hz (except GT notch)
Compression	Input level increase of 30 dB above the knee of compression causes < 3 dB output increase
Distortion	< 2%
Call Light	Sensitivity -20 dB below knee of compression
Audio Output	5 watts each speaker
Mute	Adjustable to -28 dB (with Individual Volume Control Option) or full mute Mute time 1 second to indefinite

OTHER ELECTRICAL SPECIFICATIONS

Radio Control	Local, E&M, Tone Remote, DC Remote.
Radio Channels	2-wire simplex/half-duplex or 4-wire half/full duplex.
DC Control	Operable up to 8 kΩ loop resistance Current programmable 15 mA max in 2.5 mA increments. Accuracy ±0.25 mA.
Tone Control	15 standard tones supported, programmable (no trimmer adjustment) 650-2050 Hz High Level Guard Tone duration 120/600 milliseconds Function Tone Duration 40 milliseconds Guard Tone Frequency 2175 Hz, alterable Tone frequency accuracy ±0.2%, timing accuracy ±1.0 %
Local Control	PTT normally open relay contact rated 1.0 A at 24 V_{AC}/V_{DC}
E & M Control	Tx control via PTT relay, external 48 volts required
Busy Chan. Detect	Local Cross-Busy detection, Guard Tone or DC Control detection (LOTL) optional
Recorder Outputs	1 per channel (Tx/Rx audio summation), plus 1 output per console (various combinations of select, unselect, and microphone audio) 0 dBm level, 600 ohm, single-ended outputs
Capacity	12 channels plus phone patch
Operating Temp	+5 to +50 degrees Celsius

CONSOLE POWER REQUIREMENTS

Voltage	+13.5 V_{DC} +11.5 V_{DC} minimum — +15.0 V_{DC} maximum
Current	2.5 amperes maximum

POWER SUPPLY (802-0091) SPECIFICATIONS

Voltage	+13.5 V_{DC} ±0.5 V
Current	3.5 amperes
AC Input	95 to 250 V_{AC} 47 to 63 Hertz 1.2 amperes
Approvals	UL, CSA, VDE, and CE

THEORY OF OPERATION

SYSTEM DESCRIPTION

The Model 4010 Radio Dispatch Console is a single position unit that has many built-in features. The Model 4010 is a desktop unit, and the Model 4010R is a rackmount unit. Both units have identical features and capabilities and are referred to as the Model 4010 in this manual, unless specifically stated otherwise.

The console has individual channel volume, clock and volume meter, all-mute, simul-select, alerts, site intercom, instant transmit, and individual channel frequency/PL select. The unit can be configured for between two and twelve channels, in increments of two channels. The console is self-contained and interfaces directly to either a base station or repeater wire lines.

The Model 4010 has a built-in paging encoder that is capable of generating all popular signaling formats, including: Motorola/GE Two-tone, DTMF, Rotary Dial/1500Hz or 2805Hz, Plectron, Quick-Call 1 (2+2), and 5/6-Tone Sequential. With the Instant Call Paging option, these tones can be automatically routed to the proper channel. Without this option, the tones must be manually routed. This Instant Call Paging option also allows individual control buttons to be programmed to send an entire sequence of pages.

Each channel may be optioned to support a mix of control types: DC remote, tone remote, local control, and E&M control. The DC remote control requires one optional DC Control Daughter Board per DC channel. This DC Control Daughter board also has a line-operated transmit light (LOTL) to indicate if a line is already in use via another control point. The tone remote control requires one, optional Tone Remote System Adapter Board per system. Each channel that requires tone control can now be configured with channel option switches. If a channel requires a LOTL indication, a Tone Remote LOTL Daughter Board is then added for that specific channel.

A Phone Patch card is an option that allows the console operator to establish a patch between any radio channel and a telephone line. The card has two telephone interfaces. The console can also function as a push-to-talk, single-line telephone, giving the operator the ability to receive and place telephone calls from the console. Only one Phone Patch card can be added to a system. This card does not require one of the dual channel slots.

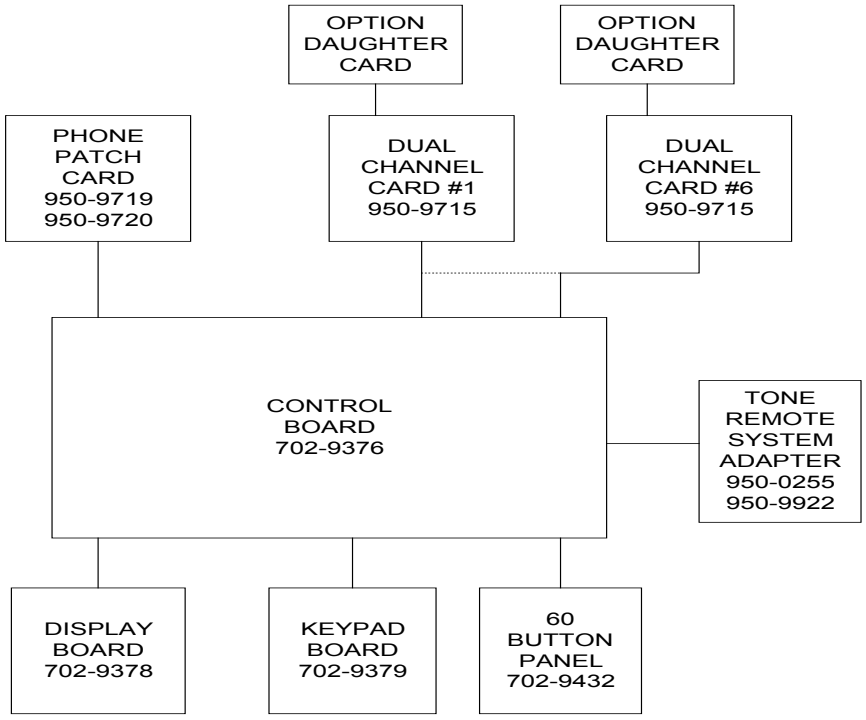
The Expanded Auxiliary I/O Card adds input and output capabilities over the standard eight inputs and eight outputs that come with every Model 4010. The Expanded Auxiliary I/O Card does require one of the Dual Channel Card slots.

The Model 4115B allows the system to be configured with an additional 60 programmable switches. The system can accept a maximum of two expansion panels. The Console Programming System (CPS) is used to define the function of any additional panels.

A variety of communications options may be configured with the console. The standard options are a desk microphone, a gooseneck microphone or PTT handset with cradle, and/or a headset.

BLOCK DIAGRAM

The M4010 electronics consists of four board assemblies and a variety of option assemblies, which are installed on the main Control Board. The main boards and option boards are listed below. A maximum of six channel cards of any mix can be installed on the Control Board.



M4010 PCB BLOCK DIAGRAM

In discussion of the system's operation, the associated U number of the ICs involved will be referred to. The schematics of the various M4010 assemblies will be required for clarity.

CONTROL BOARD (702-9376)

The Control Board has a Motorola processor 68HC11F1, which controls the operation of the system. The microprocessor is shown on sheet 2 of the schematic 008-9376. The system has 32K bytes of EEPROM memory (U29), which contains all the program storage. The data storage is in 32K bytes of battery backed RAM (U27). They connect to the microprocessor via an 8-bit data bus and 16-bit address bus. The data bus also connects to the input and output ports for interfacing to external signals. The other means of communication by the microprocessor is the serial peripheral interface (SPI) and the UART U40. The SPI bus communicates with the channel cards and tone generation module U15.

The microprocessor uses device selects to communicate with the components on the bus which are generated by the port outputs PG7 through PG4. PG4 is used to generate the other devices selects of U32. These selects control the I/O ports on the data bus.

The timing circuits of U20 and U18 take the 8MHz signal from the microprocessor and divide the clock down to 4 MHz, 500 kHz, and 9615X16 Hz. The U40 UART used the 9615X16 clock to generate the RS232 baud rate.

The LOOP IN and LOOP OUT connectors J13, J14, and J15 are used for expansion panels, console parallel status, and programming the console. These connectors are driven by U45, a RS232 driver which generates its own + and – 10 volts for drive voltage. The 68B50 UART, U40, sends and receives the serial data and generates the IRQ* interrupt to the microprocessor.

The auxiliary input connector, P8, connects the general purpose inputs to the buffer U43. The microprocessor reads this port with the SICS* device select. The auxiliary output connector, P7, contains four open collector transistor outputs, U42, and four relay contact outputs, K2 through K5. U39 is an eight bit latch which latches the signal from the microprocessor using device select POR*.

The various PTT and hook switch signals in the system are the inputs of U16 and U19. The microprocessor monitors U16 and U19 to determine which audio source the operator wants to use. On sheet 3, U24 is a latch for steering the audio sources. The latched outputs of U24 drive U22, 74C906, which translates the 5V logic levels into 12V signals to drive the various audio switches.

The device selects (on sheet 3) for the SPI bus components is generated by CHSEL* and U36, U37 and U28. There 16 selects generated, CHEN0* to CHEN14* and the select to HC05. Each CHEN signal will enable the bidirectional communication bus for that channel. The SPI bus consists of the microprocessor signals D0 (data out), DI (data in) and the SCK* (500 kHz synchronous clock).

The 68HC705 (HC05) microprocessor of the schematic, generates all the tones (except for guard tones) that are required in the console. The commands to the HC05 are through the SPI bus. The tones are generated by the 8-bit output port PA, which has its data latched into U14 by PB0. The output of the latch goes through a resistor ladder network to U7. U7 is a low pass filter which goes to a selectable volume control R62 to the tone bus driver U1. The tone bus goes to the channel card interfaces.

The input power is on connector J5. The nominal voltage is 13.5 VDC. An alternate source (battery backup) can be connected to J16. When the primary power is present, K1 is energized and a series of diodes are connected to J16. This ensures the battery voltage is below the primary power source to prevent a battery drain. When primary power is not present, K1 is released, and the series diodes are no longer in series with the battery. Regulator VR3 provides the 5Vdc for the system. VR2 provides the 5Vdc analog reference voltage and VR1 provides the 10Vdc analog power. R95, C98, R96, C88, and U44A provide a filter and a low impedance source for the analog reference.

Each of the audio amplifiers (sheet 4) for the desk microphone (U1A and R70), the headset microphone (U6B and R68) and the gooseneck microphone (U6A and R69) have an input adjustment potentiometer before being routed to the multiplexer U12. The fourth input comes from the HC05

tone generator through the adjustment potentiometer R67. The audio switches of U24 control the audio steering to U8A. U8A forms a 30dB AGC circuit whose output goes to the MIC BUS through U4B and to headset sidetone through U8B.

The select bus and unselect bus are the summing node of amplifiers U5B and U5A. The amplifier U10A is the summing node for the patch bus. The select audio goes through the switch U9A-3 to the buffer U10B, through the switch U9C-13 to the buffer U2A. This signal drives the select input of the Display Board. The unselect audio takes a similar path through U9B-1, U2B and to the Display Board. The select audio and unselect audio also are summed into amplifier U3A along with the Mic Bus. U3A drives the COMB AUDIO OUT signal on P1, the Auxiliary Audio connector, and amplifier U3B. The output of U3B goes through a peak detector circuit and forms the VU input for the microprocessor's analog to digital converter.

The AUXAUD input from P1 is an alternate source of audio that can be summed into the MIC BUS. The input is optionally terminated with 600 ohms by JP5 and amplitude adjusted by R63. The source is controlled by audio switch U11A and through the buffer U4A is sent to the summing node of U4B.

DISPLAY BOARD (702-9378)

The Display board contains the LCD display and the amplifier circuits for the select and unselect speakers. The microprocessor has a bidirectional data path using U39 to drive the interface connector P11. The read or writing to the LCD is controlled by LCDE, W/R* and A0 signals on P11. The LCD display, DS1 on the Display Board, is capable of displaying two rows of 16 ASCII characters. R21 is used to adjust the display's viewing angle and contrast. JP2 is used to set the brightness of the display. The three settings of JP2 change the display's backlight current from 120mA to 45mA and to 15mA.

The select audio from U2-1 and the unselect audio from U2-7 on the Control Board are sent to the interface connector P11. Both amplifier circuits work identically. The select circuit has R33 to adjust the audio level to the amplifier. R32 adjust the minimum audio level that R33 can be set to. R32 can be set to no audio. The push/pull amplifier circuit can deliver up to 5 watts to the speaker. The output of U4 is fed to the inverting input of U5 through R27. R34 is used to adjust the output DC level of U5 for 0 Vdc across the speaker connector JP3.

KEYBOARD (702-9379)

The system keypad and channel keypad of the M4010 are sequentially scanned by the microprocessor at a 50-millisecond interval. The scanning matrix is set up with U33 and U25 latches. P10 is the interface connector for the hex keypad and system keys.

The C0 to C6 latched signals are presented through P10 (renamed to Rx and Sx) to U3 and U4 on the Keypad Board. U3 and U4 outputs set the appropriate signal levels to the switch matrix. The individual switch status is on the COM1 output of U3, which the microprocessor reads during each matrix cycle.

The CLK1 signal from the microprocessor clocks the B0 to B7 matrix data into latches U1 and U2. The outputs of U1 and U2 drive the switch LEDs.

60-BUTTON PANEL (702-9432)

The scanning matrix outputs of U33 and U25 also go to the 60 Button Panel on P9. The C0 to C7 matrix data is connected to U10, U12, U23, U15 and U27 (renamed to Rx and Sx) on the 60 Button Panel. U10, U12 and U27A outputs set the appropriate signal levels to the switch matrix. The individual switch status is selected using RA through RC of U10 and the COM2 output is read by the microprocessor during each matrix cycle.

The B0 to B5 matrix data is buffered by U25 and connected to 20 74HCT244 latches. The CLK* and GRN/RED* signals are used to form the GRN CLK and RED CLK signals. The SA through SC signals are the addresses of the multiplexes U12 and U24. U12 selects the appropriate green LED latch, U1 through U9 and U26, that GRN CLK will clock the B0 to B5 data into. U24 does the same for RED CLK and the red LEDs latches U11 and U13 through U21.

DUAL CHANNEL CARD (950-9715)

The Dual Channel Cards (DCC) are installed on the Control Board in six connectors J7 through J12 on sheet 5 of the Control Board schematic. These connectors also interface the DCC to the output connectors J2, J3, and J4 as shown on sheet 6. Each DCC is capable of interfacing two radio channels with local control if no other optional cards are installed. The functionality of a channel can be enhanced by adding the Tone Remote System Adapter to add tone remote capability to each channel or adding the DC Remote Daughter Card to each channel that requires DC remote control.

The DCC schematic 008-9377 shows the interface connector on sheet 2. The SPI bus signals DI, DO, SCLK* and two enable signals ENCHA* and ENCHB*, are the digital communication to the board. The two channels function similar and only channel A will be followed. The data in from the microprocessor (DI) are synchronously clocked to the 16 bit serial shift register U20 and U21 using the CHWR* and ENCHA* signals. The data to the microprocessor (DO) is simultaneously clocked out of U15 and an 8-bit shift register on the daughter board if one is installed at connector P2. U20 and U21 form a 16-bit output latch, which controls the operation of the board. The outputs are buffered by U22 and U23, which convert the 5V signals to 12V to drive the various audio switches. U15 and the daughter card latch form a 16 bit input port which monitor the activity of the board.

The audio paths for channel A are shown on sheet 2. The four input audio busses are GT-BUS (guard tone bus), PAT-TX-BUS (patch transmit bus), TONE-BUS (ANI and alert tones) and MIC-BUS (operator's audio). These busses are switched by the three switches of U13 to the input of U2A. The audio switch U14B is used to select high or low level guard tone. U9A connects the output of U2A to transmitting amplifier U2B. The potentiometer R11 sets the transmit level to the radio. The maximum peak to peak level on each bus is –10 dBm. The maximum gain on the card is 20 dB, which gives the maximum output level of +10 dBm. The output of U2B goes the buffer U2C and the inverting buffer U3A, which form the push/pull amplifier to the transformer T1. Switches U1A and U1B send the transmitted audio through R4 while transmitting. R4 sets the transmit impedance to

600 ohms. During 2W (two wire) receive, the audio is switched through U1C. JP1 sets the receive impedance to 600 ohms if in position A and to 3500 ohms if in position B. CR1 and CR2 are protection diodes. The output transformer T1 has the DC blocking capacitor C5 on the center taps of the output windings.

The XMIT-UP-A signal control the transmit switches and relay K1. The relay contacts are routed through JP5 and form the isolated PTT signal on the external connector. The BUSY-OUT-A signal is driven by the open collector driver U30F to the external connector. The time of this signal is very similar to the transmit signal PTT. The JP4 jumper setting controls the guard tone switch U13B. Position A disables the guard tone switch and should be in this position for all channels that are not tone controlled. Position B allows the switch to be controlled by the ENGT-A signals, which is the normal position for tone control. Position C enables XMIT_UP_A to control the switch and is only used when retrofitting early production units.

The 2W receive from U1C goes to potentiometer R10 for setting the receive audio level to the summing amplifier U3A. The 4W (four wire) audio input signals 4W-RX-A+, or -, come into the 10K ohm transformer T2. JP2 sets the impedance of the 4W input to 600 ohms in position A or 10K ohms in position B. The output of T2 goes to potentiometer R9 which sets the receive level and to the summing amplifier U3A. The output of U3A goes to the AGC circuit formed by U3B. The receive level should be adjusted by inputting the minimum audio level expected in the field and setting the adjustment potentiometer for the knee of compression of the AGC circuit. The adjustment potentiometer for the audio receive circuit not use should be set for no audio (fully CCW) so the circuit does not add any noise to the summing node of U3A.

The signal level at the output of the AGC circuit (U3B-7) is limited to 1.2 V peak to peak. The AGC circuit will maintain this maximum peak level as long as the input is above the knee of compression and within the 30dB (minimum) range. This signal drives U4A whose output forms a peak detector and generates the CALLA signal when audio is present. The AGC output also drives the U4B amplifier, which sets the audio peak level to –10dBm for the RXA test point and the REC-A signal through U8B to the external interface. The RXA signal also goes to the PAT_RX_BUS through switch U9C. U12 multiplexes the RXA signal through a resistive network to give 4dB adjustment steps. The VOL signals to U12 selects which resistive path the audio takes and the MUTE_A signal will inhibit all switches from closing and provide a completed muted signal. The output amplifier U8A will drive either the SEL-BUS or UNS_BUS depending on the U28B switch setting. If no audio muting is required, the audio will be switched through R73 and the peak output level of U8A will be at –10dBm.

PHONE PATCH CARD (950-9719 OR 950-9720)

The Phone Patch interface to the Control Board is connector J6. This will interface either a Phone Patch Card (with one phone channel) or the Dual Phone Patch Card. The card will allow the operator to utilize a standard loop start telephone line. Both telephone circuits are identical. Only the operation of the A channel will be described.

The Phone Patch schematic 008-9403 (single) or 008-9522 (dual) shows the interface connector on sheet 2. The SPI bus signals DI, DO, SCLK* and two enable signals ENCHA* and ENCHB*, are the

digital communication to the board. The two channels function similarly and only channel A will be followed. The data in from the microprocessor (DI) are synchronously clocked to the 16 bit serial shift register U26 and U29 using the CHWR* and ENCHA* signals. The data to the microprocessor (DO) is simultaneously clocked out of U35. U26 and U29 form a 16-bit output latch, which controls the operation of the board. The outputs are buffered by U18 and U23, which convert the 5V signals to 12V to drive the various audio switches. U35 is an 8-bit input port that specifies the board type and monitors the ring detector and call activity.

The telephone line's tip and ring are connected to J1. In the off-hook state, the signal goes through relay K1 to the ring detect circuit of U19. The signal flows through U22C, U22F and U28A to U35. The microprocessor reads the status of U35 with the SPI bus. The ring detect signal also goes through U18A to the tone generator U6. When a ring is detected, U6 generates a ringing tone at pin 14 and sums it on the audio receive bus at U3A. When the call is answered, relay K1 is activated with the AUXOUTA signal and the line is switched to relay T1.

The three input audio busses are PAT-TX-BUS (patch transmit bus), TONE-BUS (DTMF tones) and MIC-BUS (operator's audio). These busses are switched by U17A and U17B to the input of U8B. The output of U8B goes to the audio switch U15C is used to enable the audio to the output amplifier U4A. The audio also goes to U11, which forms a peak detector that prohibits the transmitted audio from exceeding -10dBm average for over 2 seconds. The output of the detector controls the audio switch U15C through U18C.

The center tap of the transformer T1 is connected to the line termination network of U1A. Potentiometer R16 set the resistive balance and is usually set for minimum sidetone. R21 is used for capacitive balance and is also adjusted for minimum sidetone. The audio receive amplifier, U1B, goes through the switch U15B and to the audio level adjustment R18. U3B form a peak detect circuit and generates the voice activated signal to U35. The receive audio also goes to the summing node of U3A. The audio signal goes to the switch U15A to the PATCH-RX-BUS and to U13, the volume control selector. U13 multiplexes the RXA signal through a resistive network to give 4dB adjustment steps. The A, B and C signals to U13 selects which resistive path the audio takes and the INH signal will inhibit all switches from closing and provide a completed muted signal. If no audio muting is selected, the audio will be switched through R72 giving the maximum signal level. The output amplifier U8A will drive either the SEL-BUS or UNS_BUS depending on the U17C switch setting.

AUXILIARY I/O CARD (950-9721)

The Auxiliary I/O Card will expand the I/O capability of the system by adding 6 outputs and 6 inputs. The card is installed in any of the six dual channel card slots and the connection to the I/O are on the interface connectors J2 through J4 depending on the slot(s) the card is installed in.

The I/O Card schematic 008-9448 shows the SPI bus signals DI, DO, SCLK* and enable signal ENCHA*. The data in from the microprocessor (DI) are synchronously clocked to the 8-bit serial shift register U2 and into the output latch using the CHWR* and ENCHA* signals. Six of the outputs use the transistor driver IC, U1, to control the output relays K1 through K6. The data to the microprocessor (DO) is simultaneously clocked out of U5 and U6. U5 monitors the six input signals and U6 identifies which card type is installed.

The inputs from the interface connector have a 10K-ohm pull-up to 12Vdc, a 10K-ohm series resistor, a Zener diode to limit the voltage level and a .01 microfarad capacitor for noise filtering. U4 is a 74HC14 that provides a Schmitt trigger input.

The relay outputs each have two jumpers associated with them. Output 1 has one connection RLY1A on P4-5 and the second connection RLY1B on P4-4. The RLY1A connects to JP7, which makes a normally open output in position A and a normally closed output in position B. The common connection of K4 goes to JP1, which is connected to RLY1B in position A. With JP1 in position B the relay common is connected to digital ground. With jumpers in both positions B and D the RLY1A signal is connected to ground when the output is on and RLY1B is connected to ground when the output is off.

TONE REMOTE SYSTEM ADAPTER (950-0255)

The Tone Remote System Adapter adds the tone remote capability to all the radio channels. The card adds the 2175Hz guard tone to the system and guard tone filters on the four audio busses. The schematic for the card is 008-0037.

From the Control Board's interface connector J1, the unselect bus (UNS IN), select bus (SEL IN), microphone bus (MIC IN) and the patch bus (PAT IN) all go through a low-pass filter to a 2175HZ notch filter. The switch capacitor filter (U19 through U22) is a 35dB notch filter centered at 2175Hz and a 200Hz bandwidth. The output of the notch filter, N/HPB, goes trough a low-pass filter and back to the interface connector J1. The jumpers JP6 and JP7 allow the filters to be removed for the patch bus and mic bus.

U17 interface to the crystal Y1 and along with U14 and U16B form the 2175Hz oscillator. U18B and U15 form a filter and amplifier for the guard tone. R47 provides the amplitude adjustment.

Sheet 2 of the schematic is for audio delay, and the components are not included with this assembly.

TONE REMOTE SYSTEM ADAPTER W/AUDIO DELAY (950-9922)

The Tone Remote System Adapter with Audio Delay adds the tone remote capability to all the radio channels. The card adds the 2175Hz guard tone to the system and guard tone filters on the four audio busses. The card also provides a variable audio delay for two of the busses, patch bus and microphone bus. The schematic for the card is 008-9896.

From the Control Board's interface connector J1, the unselect bus (UNS IN), select bus (SEL IN), microphone bus (MIC IN) and the patch bus (PAT IN) all go through a low-pass filter to a 2175HZ notch filter. The switch capacitor filter (U19 through U22) is a 35dB notch filter centered at 2175Hz and a 200Hz bandwidth. The output of the notch filter goes through a low-pass filter. The select bus and unselect buses are then the UNS OUT and SEL OUT signals on connector J1. The patch bus and mic bus go to the jumpers JP6 and JP7 which allow the notch filters to be bypassed and then go to the audio delay circuits on sheet 2.

U17 interfaces to the crystal Y1 and, along with U14 and U16B, forms the 2175Hz oscillator. U17 also provides the 3.48MHz clock for the audio delay circuit of sheet 2. U18B and U15 form a filter and amplifier for the guard tone. R47 provides the amplitude adjustment for the guard tone.

On sheet 2, the patch bus and mic bus go to a continuously variable slope delta (CVSD) modulator U12 and U13. The DIGOUT of the modulator is the digitized audio which goes to a buffer, U8, and is enabled to the DRAM input by /OE. The same DRAM data goes to the DATA input of U5 and U9, the CVSD demodulators. AOUT of U5 and U9 is the delay audio output, which is filtered and put back on the MIC OUT and PAT OUT signals of J1. The MIC delayed audio can be bypassed by activating the audio switch U4A, which the main processor has under software control. This switch is activated when using the Phone Patch Card. The jumpers JP2 and JP3 enable the delay circuit to be bypassed for either bus.

The cycle rate and synchronous signals for the audio delay circuit are generated by the PAL, U7. U16A divides the 3.28MHz clock by 8 and forms the master clock for the PAL's internal state machine. The PAL generates seven states for circuit timing at 62KHz cycle rate. JP1 selects the audio time delay options for the PAL at .25, .50, .75, and 1.0 seconds. The time settings determines when the CLR (clear) signal is generated to restart the address counters U2 and U11. The multiplexers U3 and U10 are interleaved by /OE for the RAS and CAS addresses of the 4Meg DRAM, U6. The stored digitized data from RAM is clocked out to U5 and U9 in the first part of the clock cycle to form the delayed audio output. The received audio data from U12 and U13 is stored in RAM on the second part of the clock cycle.

DC REMOTE CHANNEL ADAPTER (950-9716)

The DC Remote daughter card adds the DC current control to the channel it is installed on. The card is capable generating a current source from zero to 15 milliamps in 0.5 milliamp increments. The card also provides the line operator transmit light (LOTL) indication if the channel is busy to the operator. The schematic for the card is 008-9380.

The interface to the line transformer's center taps is LOOP+ and LOOP- and the external line connections are BSY+ and BSY-. The signals associated with the DC current control is CURRENT*, CLEAR, HOLD and NEG-POL. The steady state levels provide a '1' at U4A-3 and keeps Q1 turned on. This causes current to flow in U5 and applies voltage at U5-4. This voltage is generated by the 150Vdc through R9 and regulated by the CR6 Zener to 6Vdc. With voltage applied, the inputs to U6A and U6B are both at '1'. This causes the clock and clear inputs of U7A and U7B to be in the inactive state. U7A and U7B form a 32 bit counter.

The CLEAR signal will turn off Q1 and the output of U5. The inputs of U6A and U6B will then start to discharge their input capacitors through their series 330K resistors and R11. The CLEAR signal will be maintained longer than the RC time constant formed by C8, R10, and R11 to generate a reset signal to U7.

When the HOLD signal is low, the CURRENT* signal enabled to turn off Q1. CURRENT* is a series of pulses which allows the input of U6B to discharge through R12 and R11 but are shorter in duration than the time required to trigger U6A. The U6B signal will generate a series of clock pulses

to the U7 counter. The count of zero is no current and the maximum count of 30 is for a 15 mA output current. The binary count goes to the resistor R/2R network RP1 and to the feedback amplifier U8B and Q2. The potentiometer R15 is adjusted so each binary count produces 0.25 mA of collector current through Q2 and the LOOP- signal when connected to a load through the output transformer. The relay K1 is driven by the NEG-POL signal to reverse the direction of current flow through the load.

The power source for the current generator is PS1, which is a 12Vdc to 150Vdc switching regulator. The 150V source goes through the blocking diode CR10 and relay K1 to the LOOP+ connection.

The BSY+ and BSY- signals come from the radio line inputs. If the line is in use by another parallel console, there will be a voltage potential across the signal pair. This voltage will charge C4 through R6. The diode bridge will connect the charge of C1 across the input of U2. The CURRENT* signal is a low going pulse which turns on U3 collector and dumps the C1 charge through U2 input. The collector of U2 produces a high at U1A-2 and the trailing edge of CURRENT* will latch the U1A-2 state into U1A. This BSY '1' state will cause the LOTL* signal at J1 to go low and light the LOTL LED on the rear panel.

When the radio line is no longer in use, the BSY lines have no voltage and C1 is discharged. The next CURRENT* pulse will clock a '0' into U1A returning LOTL* high. Jumper JP1 disables the LOTL circuit in the B position.

TONE REMOTE LOTL CHANNEL ADAPTER (950-9719)

The Tone LOTL Daughter Board will generate a LOTL signal if a tone remote parallel console is using the radio line. The schematic for the board is 008-9450. The board is the same as 950-9722 with the DTMF decoder circuit not installed.

From the Dual Channel Card's daughter board connector J1, the receive audio (RX) signal goes to an internal amplifier input AIN of U5. U5 is a band pass, switched capacitor filter that is tuned for a center frequency of 2175Hz at the CMOS and RC inputs. The C8, R15, R14, and R16 form the tuning circuit. When a high level guard tone at 2175Hz is passed through the filter, the amplifier U4A forms a peak detector to the input of U3A. The holding capacitor C5 will hold the detected peaks and provide a steady-state signal at U3B. With JP1 in position A, the signal will drive Q1 and the LOTL LED on the back panel and the feedback FET Q2. Q2 will lower the impedance in the input amplifier U4A and increase the gain. The gain will increase 30dB so the amplifier will keep locked on the low level guard tone signal. The LOTL* output to the channel card will remain low until the guard tone signal is dropped.

INDIVIDUAL CHANNEL DTMF ANI DECODER (950-9722)

The Tone LOTL/DTMF Decoder Daughter Board will decode any DTMF signals and generate a LOTL signal if a tone remote parallel console is using the radio line. The schematic for the board is 008-9535.

From the Dual Channel Card's daughter board connector J1, the DTMF decode circuit interfaces the receive audio (RX) signal. This signal goes to amplifier U4B and to the AIN input of U1, the DTMF decoder. When a valid DTMF signal is detected, the DV output high and clocks the latch U2B. When the microprocessor reads the status of the card with the SPI bus, the ENCH signal goes high and generates a load (LD) signal to U6. U6 will read the output of U2B (the latched DV signal) and the DTMF decoded digits of U1. The SPI clock (SCLK*) will shift out the latched data on the DATA line. The SCLK* signal will also clear the latched DV signal (U2B).

The RX signal also goes to an internal amplifier input AIN of U5. U5 is a band pass, switched capacitor filter that is tuned for a center frequency of 2175Hz at the CMOS and RC inputs. The C8, R15, R14, and R16 form the tuning circuit. When a high level guard tone at 2175Hz is passed through the filter, the amplifier U4A forms a peak detector to the input of U3A. The holding capa-citor C5 will hold the detected peaks and provide a steady-state signal at U3B. With JP1 in position A, the signal will drive Q1 and the LOTL LED on the back panel and the feedback FET Q2. Q2 will lower the impedance in the input amplifier U4A and increase the gain. The gain will increase 30dB so the amplifier will keep locked on the low level guard tone signal. The LOTL* output to the channel card will remain low until the guard tone signal is dropped.

INDIVIDUAL CHANNEL 5-TONE ANI DECODER (950-9707, 950-9708)

The Channel 5-Tone ANI Decoder Board will monitor the receive audio signal and decode either ZVEI (950-9707) or CCIR/EEA (950-9708) tone received on the channel it is installed on. Both options use the same circuit board (schematic 008-0147, BOM 702-0147). They differ only in the software installed.

From the Dual Channel Card's daughter board connector J1, the receive audio RX signal goes through amplifier U4A, through a high-pass RCF filter (R3, C6), and to the 5-tone detector U2. When a valid tone is detected, U2 generates the IRQ output, which generates an interrupt on U1. The U1 microcontroller, a 68HC05 derivative, reads the tone from the decoder using the serial bus that connects the two chips (signals SERCLK, COMMAND, REPLY, and CS). After some additional processing to validate the tone, the microcontroller sends the tone to the M4010 main board using the SPI bus, signals SCLK*, ENCH*, and D0 signals.

INDIVIDUAL CHANNEL FSK ANI DECODER (950-9709)

The Channel FSK ANI Decoder Board will monitor the receive audio signal and decode the FSK tones received on the channel it is installed on. The schematic for the board is 008-9583.

From the Dual Channel Card's daughter board connector J1, the receive audio RX signal goes through amplifier U7A and to the 5-tone detector U3 (U2 and U4 are not installed). When a valid FSK pattern is detected, U3 will generate the RXSYN output, which is synchronous internally to the incoming data. This signal connects to Q1, which generates the IRQ* interrupt to U1. The U1 processor, 68HC05, will read the data on D4 and the carrier detect signal on D5 and place the data in the internal SPI bus register. The main microprocessor will read the information with the SCLK*, ENCH* and D0 signals.

INDIVIDUAL CHANNEL GE-STAR ANI DECODER (950-9625)

The Channel GE-Star ANI Decoder Board will monitor the receive audio signal and decode the tones received on the channel it is installed on. The schematic for the board is 008-9741.

From the Dual Channel Card's daughter board connector P1, the receive audio RX signal goes through amplifier U7B, the wave shaping circuits of U6 and the U5 comparater. The output of U5 is the IRQ interrupt to U2, 68HC05 microprocessor. U2 will convert the data into the ANI digits and place the data in the internal SPI bus register. The main microprocessor will read the information with the SCLK*, ENCH* and D0 signals.

SYSTEM REPAIR

DIAGNOSTIC MESSAGES

If the console's continuous system diagnostics finds a problem, the console LCD will display a diagnostic message indicating the general nature of the problem. The following table shows the various diagnostics messages and their meanings.

Message	Meaning
THX nnn	An internal error has occurred on the console. The "nnn" is a three digit, decimal number that the factory can use to help isolate the condition. Be sure to record this number. This condition does not usually prevent normal operation.
CardErr	The programmed channel configuration of the console does not match the channel cards in the console. Channels that are affected will not operate until the problem is corrected.
CPSdataErr	The Model 4010 CPS configuration data has been corrupted or was never initialized. Reprogram the Model 4010. Refer to the Model 4010 Programming Manual (Part No. 025-9229) for more information.

CARD REMOVAL AND INSTALLATION

To remove and install the Dual Channel Card and other removable option cards, follow the steps below:

1. Disconnect power.

2. Open the console by unscrewing the two latches on the back of the console and lifting the top open.

Caution

Keep the front of the unit on the top of the table; do not let the front hang over the table edge. The console can easily be knocked off balance onto the floor when the front hangs off the table.

3. To remove a card, unscrew the single mounting screw on the rear of the console and rock and lift the card up and away from the back of the unit.

4. To install a card, insert the side away from the back panel in first, then rock the card towards the back panel into position. Take care that the LEDs get properly positioned. Secure the card by inserting the screw through the hole in the back panel into the bracket on the card.

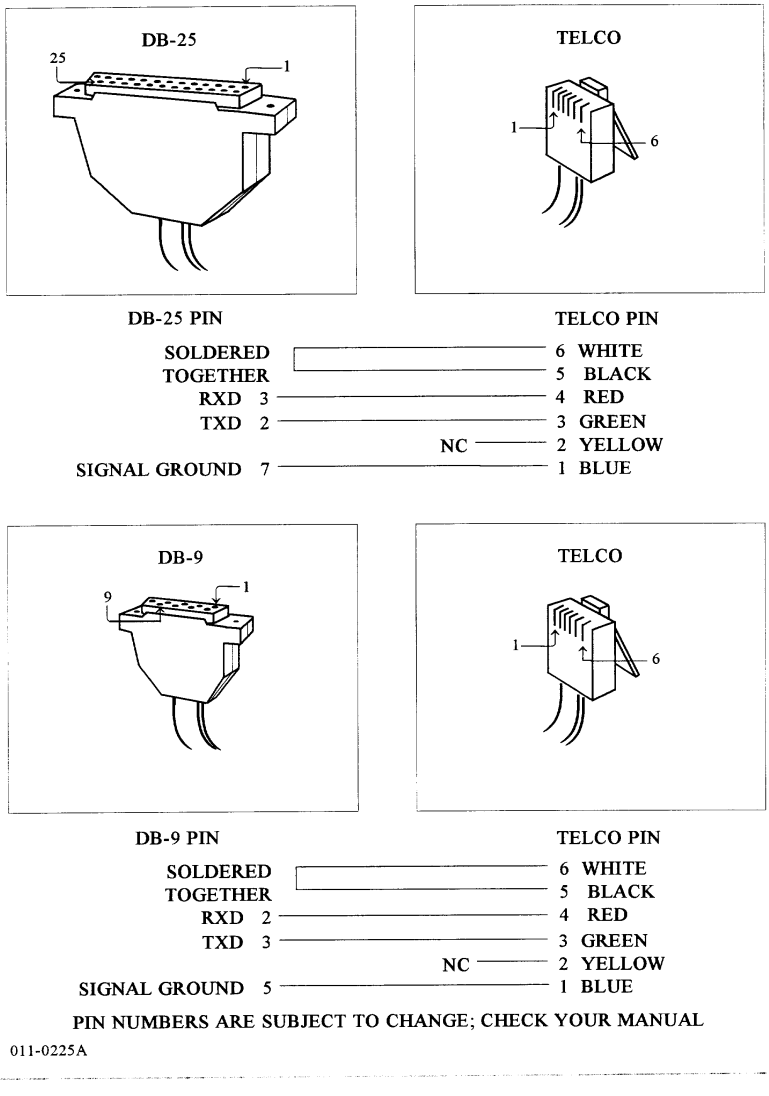
5. Close the console and tighten the two latches on the back of the unit.

6. Connect to power; the configuration changes are sensed on power up.

MODEL 4010 PROGRAMMING CABLE WIRING DIAGRAM

ZETRON TECHNICAL INFORMATION

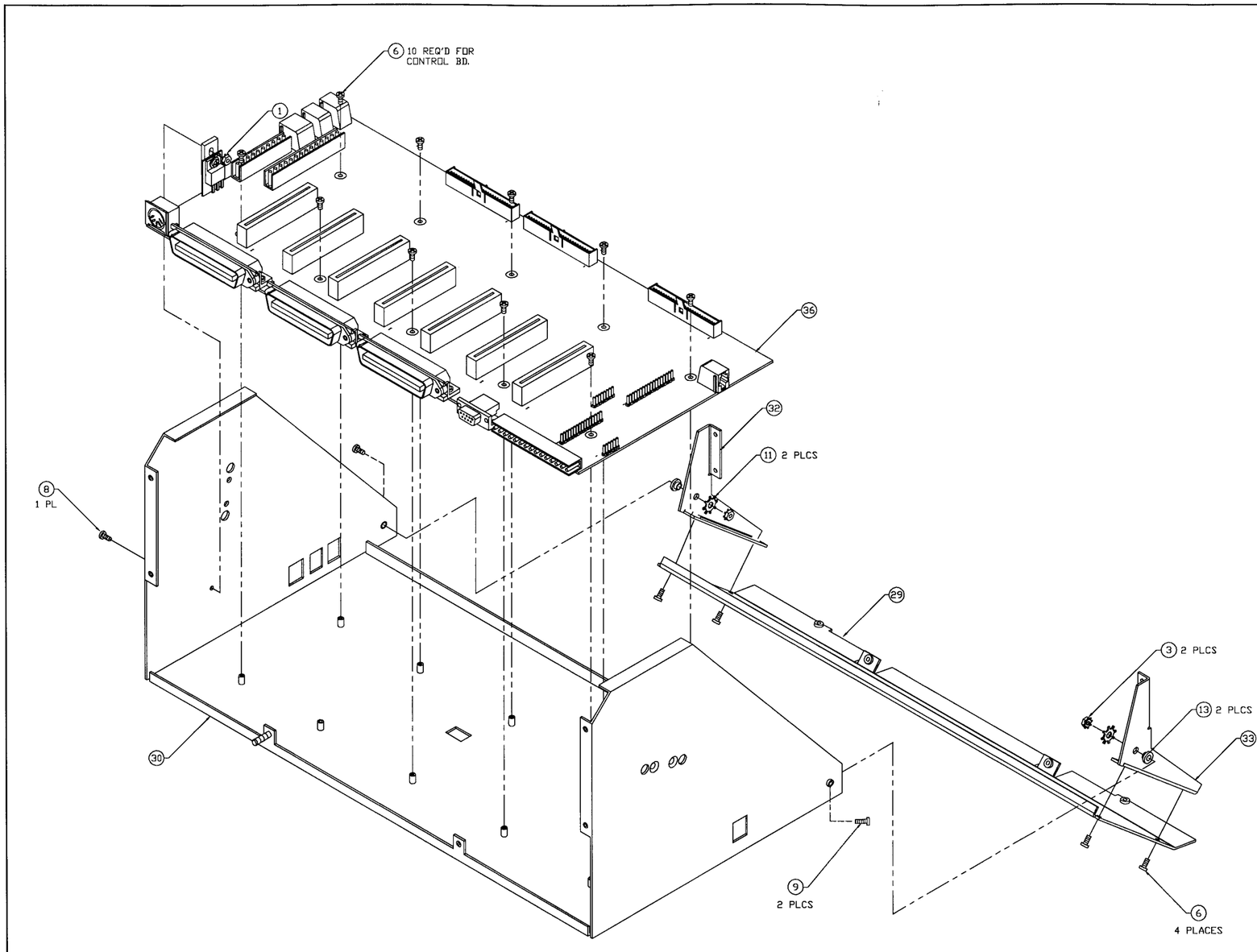
MODEL 4010 PROGRAMMING CABLE
WIRING DIAGRAM



SERVICE DIAGRAMS

The remainder of this manual is devoted to the various PCB parts lists, schematics, component silk-screens, and assembly drawings that apply to the Model 4010 and Model 4115 consoles.

MODEL 4010 COMMUNICATIONS CONSOLE ASSEMBLY (024-0171A)



REVISION	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
A	RELEASE (ECN 2913)	VP			

NOTES:

1. REFERENCE 901-9269

ITEM	QTY.	PART NUMBER	DESCRIPTION
41	2	709-8002	CABLE, FLEX, 24 POS, 4"
40	1	709-8000	CABLE, FLEX, 24 POS, 7"
39	1	702-9432	M4010 60 BUTTON BOARD
38	1	702-9379	M4010 KEYPAD BOARD
37	1	702-9378	M4010 DISPLAY BOARD
36	1	702-9376	M4010 CONTROL BOARD
35	6	431-0006	FOOT, BUMPON
34	1	415-9754	ZETRON LOGO LABEL
33	1	415-9616	LEFT KEYPAD BRACKET
32	1	415-9615	RIGHT KEYPAD BRACKET
31	1	415-9593-1	MODEL 4010 DISPLAY PANEL, FIN
30	1	415-9592-1	BASE PANEL
29	1	415-9591-1	KEYPAD PANEL
28	1	415-9590-1	MODEL 4010 REAR PANEL, FIN
27	1	415-9589-1	MODEL 4010 FRONT PANEL, FIN
26	1	415-9588	MODEL 4010 PLASTIC HOUSING
25	2	415-9580	M4010 CONSOLE END LABEL
24	8	415-9532	M4115 CONSOLE CHANNEL LBL
23	2	415-9193	SPEAKER GRILL CLOTH
22	8"	408-2401	24 GA, WIRE STRANDED, BLACK
21	2	401-0175	2 COND 1 DC, 26 GA X .1
20	2	305-0021	SPEAKER 4 OHM 5W
19	4.5"	269-0005	CATERPILLER GROMMET
18	2	265-0026	CAP, W/LINE FOR 15MM KNOB
17	1	265-0025	CAP, PLAIN, FOR 15MM KNOB
16	1	265-0024	KNOB,PLAIN,15MM/ 1/4" SHAFT
15	2	265-0023	KNOB, W/LINE 15MM/6MM SHAFT
14	4	251-1239	440X.031 NYLON
13	2	236-0009	NYLON SHOULDER WASHER
12	4	236-0001	MICA WASHER TO-220
11	2	234-0013	#12 STAR WASHER
10	4	234-0007	INSULATING WASHER
9	2	220-0506	832X5/8 PAN PHILLIPS
8	6	220-0213	440X3/8 PAN PHILLIPS BLK OXIDE
7	4	220-0212	440X3/8 FLAT HEAD PHILLIPS
6	40	220-0108	440X1/4 PAN PHILLIPS
5	4	220-0106	440X5/16 PAN PHILLIPS
4	3	220-0102	440X3/8 PAN PHILLIPS
3	2	210-0012	8-32 NY INST LKNUT ZC PLTD BKTS
2	1	210-0002	632 KEPT NUT PLATED
1	11	210-0001	440 KEPT NUT PLATED

DRN VP 3-29-95
CHK
APV
TOLERANCES (UNLESS AS NOTED)
DECIMAL ±.XX +.01 ±.XXX ±.005
ANGULAR ± 1°

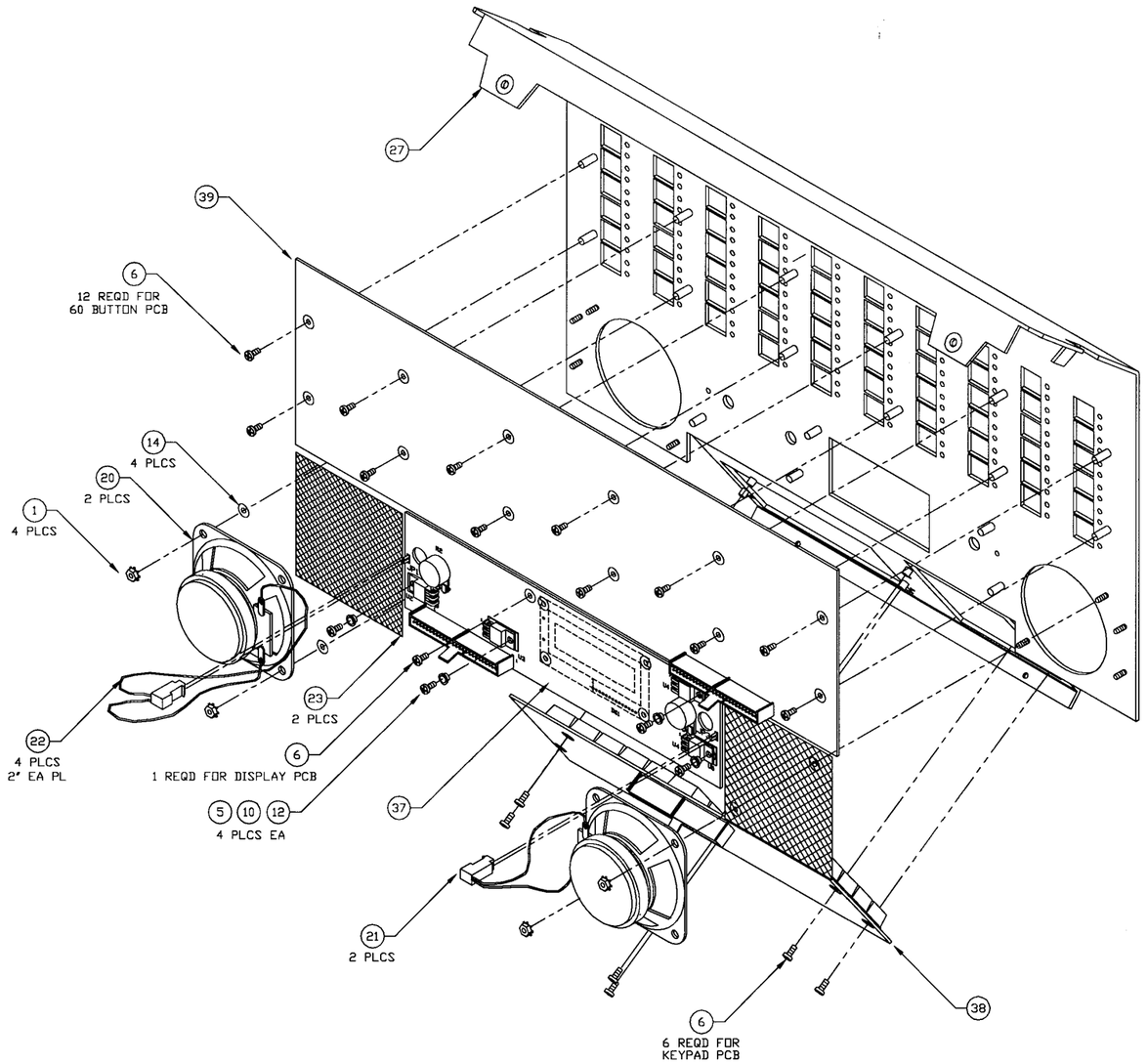
ZETRON INCORPORATED
12034 134TH COURT NORTHEAST
REDMOND, WASHINGTON 98052-2433

TITLE: 4010 COMMUNICATIONS CONSOLE ASSEMBLY

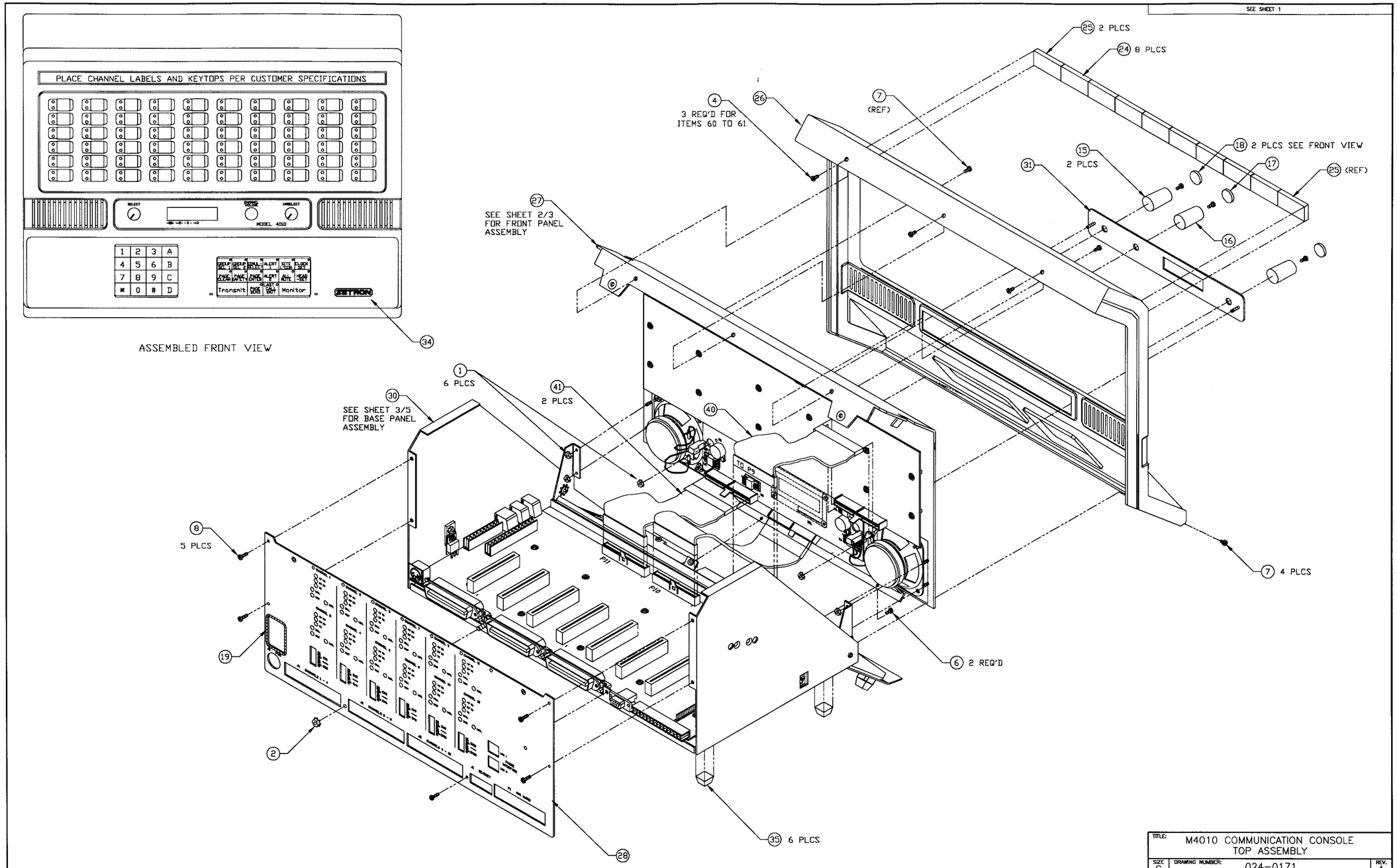
SIZE D | DRAWING NUMBER: 024-0171 | REV. A

SCALE: 1 = 1 | DO NOT SCALE DRAWING | SHEET 1 OF 3

SEE SHEET 1



TITLE: M4010 COMMUNICATION CONSOLE ASSEMBLY			
SIZE C	DRAWING NUMBER: 024-0171		REV. A
SCALE: 1 = 1	DO NOT SCALE DRAWING	SHEET 2	OF 3



TITLE: M4010 COMMUNICATION CONSOLE TOP ASSEMBLY			
SIZE C	DRAWING NUMBER: 024-0171		REV. A
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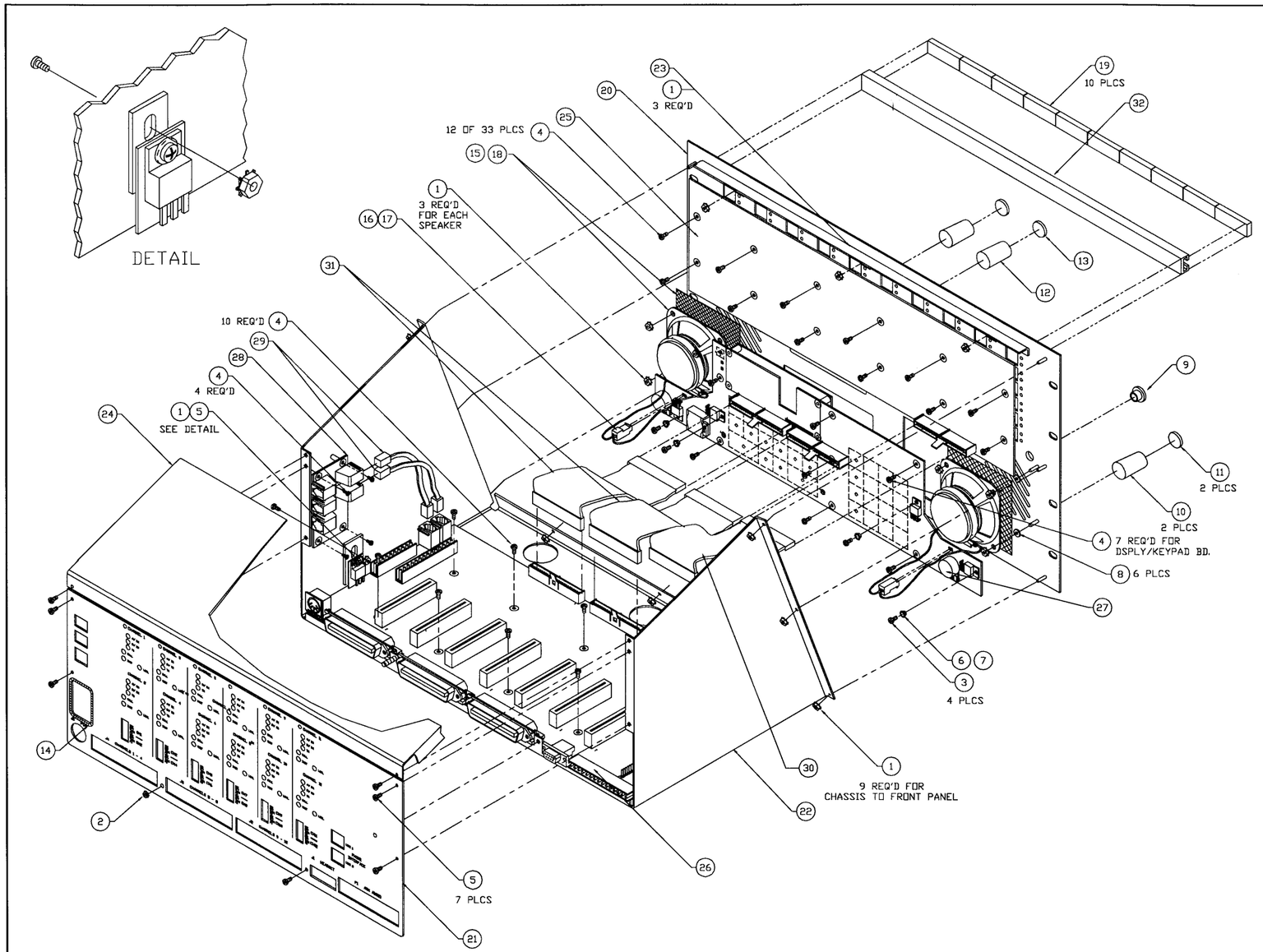
MODEL 4010R RACKMOUNT CONSOLE ASSEMBLY (024-0176A)



REVISIONS

REV	DESCRIPTION	DRAWN	APPRVD	DATE
A	RELEASE (ECN 2913)	VP		

NOTES: REFERENCE 901-9335

ITEM	QTY.	PART #	DESCRIPTION
32	1	810-0055	BLK ALUM. CHANNEL
31	2	709-8002	CABLE, FLEX 24 POS 4"
30	1	709-8000	CABLE, FLEX 24 POS 7"
29	2	709-7265	M4010R MODULAR LOOP CAB.
28	1	702-9572	60 BUT INTERFACE PCB
27	1	702-9570	M4010R DSPLY/KBOARD PCB
26	1	702-9569	M4010R CONTROL BOARD
25	1	702-9432	M4010 60 BUTTON BOARD
24	1	415-9852	M4010R TOP COVER
23	1	415-9844	M4010R UPPER BRACE
22	1	415-9836	M4010R REAR CHASSIS
21	1	415-9835-1	M4010R REAR COVER
20	1	415-9834-1	M4010R FRONT PANEL, FIN.
19	10	415-9532	M4115 CONSOLE CHAN. LBL
18	2	415-9193	SPEAKER GRILL CLOTH
17	8"	408-2401	24 GA WIRE BLACK
16	2	401-0175	2 COND IDC 26GA. X .1
15	2	305-0021	SPEAKER 4 OHM 5W
14	4.5"	269-0005	GROMMET
13	1	265-0015	CAP FOR 265-0014
12	1	265-0014	KNOB W/O IND. BLOCK
11	2	265-0013	CAP FOR 265-0012
10	2	265-0012	KNOB W/ IND. BLOCK
9	1	265-0037	HOLE PLUG, 7/16" BLK
8	6	251-1239	440X.031 FIBER SPACER
7	4	236-0001	MICA WASHER TO-220
6	4	234-0007	INSULATING WASHER
5	8	220-0213	440X3/8 PAN HD. PH. BLK
4	35	220-0108	440X1/4 PAN HEAD PH.
3	4	220-0106	440X5/16 PAN PHILLIPS
2	1	210-0002	632 KEPT NUT PLATED
1	19	210-0001	440 KEPT NUT PLATED

DRN VP 9-30-95
CHK
APV

TOLERANCES (EXCEPT AS NOTED)
DECIMAL ±.XX ±.01, ±.XXX ±.005
ANGULAR ± 1°
SCALE: — = 1
SHEET: 1 OF 1

ZETRON
ZETRON, INC., 12335 134TH COURT N.E., REDMOND, WA 98052

TITLE:
4010R RACK MOUNT
COMMUNICATIONS CONSOLE ASSY

DRAWING NUMBER: 024-0176 | REV: A | SIZE: D

DO NOT SCALE DRAWING

MODEL 4010 BOARDS

Control Board Parts List (702-9376L)

LEGEND:

+	=	OPTION, INSTALL PER CUSTOMER ORDER
#	=	NOT INSTALLED
^	=	INSTALLED ON HIGHER ASSY
=	=	SUBSTITUTE PART

ZETRON MODEL 4010 CONTROL BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R92	101-0025	10 OHM 1/4W 5% CARBON FILM	
2	3	R6,R20,R49	101-0049	100 OHM 1/4W 5% CARBON FILM	
3	5	R37,R43,R98,R99,R100	101-0057	220 OHM 1/4W 5% CARBON FILM	
4	3	R36,R84,R85	101-0061	330 OHM 1/4W 5% CARBON FILM	
5	2	R13,R53	101-0068	620 OHM 1/4W 5% CARBON FILM	
6	9	R2,R4,R8,R25,R30, R31,R32,R39,R91	101-0073	1.OK 1/4W 5% CARBON FILM	
7	6	R27,R28,R29,R58, R102,R103	101-0074	1.2K 1/4W 5% CARBON FILM	
8	1	R78	101-0085	3.3K 1/4W 5% CARBON FILM	
9	3	R5,R81,R97	101-0089	4.7K 1/4W 5% CARBON FILM	
10	21	R9,R35,R38,R48,R59, R60,R65,R66,R73,R74, R75,R76,R77,R79,R82, R83,R86,R88,R90,R95, R101	101-0097	10K 1/4W 5% CARBON FILM	
11	5	R12,R16,R21,R23,R24	101-0101	15K 1/4W 5% CARBON FILM	
12	1	R19	101-0103	18K 1/4W 5% CARBON FILM	
13	4	R14,R33,R51,R52	101-0104	20K 1/4W 5% CARBON FILM	
14	1	R89	101-0105	22K 1/4W 5% CARBON FILM	
15	1	R26	101-0106	24K 1/4W 5% CARBON FILM	
16	1	R15	101-0107	27K 1/4W 5% CARBON FILM	
17	2	R72,R40	101-0109	33K 1/4W 5% CARBON FILM	
18	1	R50	101-0111	39K 1/4W 5% CARBON FILM	
19	2	R46,R34	101-0113	47K 1/4W 5% CARBON FILM	
20	1	R3	101-0115	56K 1/4W 5% CARBON FILM	
21	15	R1,R10,R18,R22,R41, R47,R54,R55,R56,R57, R61,R64,R71,R80,R96	101-0121	100K 1/4W 5% CARBON FILM	
22	1	R45	101-0125	150K 1/4W 5% CARBON FILM	
23	2	R11,R44	101-0129	220K 1/4W 5% CARBON FILM	
24	1	R17	101-0141	680K 1/4W 5% CARBON FILM	
25	1	R42	101-0148	2.0M 1/4W 5% CARBON FILM	
26	1	R87	101-0160	10M 1/4W 5% CARBON FILM	
27	1	R94	103-0047	RESISTOR, 47 OHM 1W 5%	
28	1	R93	103-0175	RESISTOR, 75 OHM 2W 5%	
29	1	RV1	105-0002	VARISTOR 14V AC	
30	7	R7,R62,R63,R67,R68, R69,R70	108-0103	10K POT 4 TURN	
31	1	RP1	119-0003	3.3K x 7 BUSSED 8-PIN SIP	
32	1	RP5	119-0006	10K x 9 BUSSED 10-PIN SIP	
33	2	RP4,RP3	119-0008	10K x 7 BUSSED 8-PIN SIP	
34	1	RP2	119-0021	R/2R 100K/200K 10 PIN SIP	
35	7	C4,C5,C7,C17,C31, C32,C34,C86#	150-0096	1000 PF 1KV +-10% CERAMIC DISC YSP	
36	39	C35,C38,C40,C45, C48,C49,C50,C51,C52,C53, C56,C57,C58,C59,C60,C61, C63,C64,C65,C67,C68,C69, C71,C72,C73,C74,C75,C76, C77,C78,C79,C80,C81,C83, C84,C88,C99,C101,C103	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	
37	1	C27	151-0010	100PF 100V/200V +-10%/5% CERAMIC NPO	
38	2	C54,C55	151-0022	22PF 100V/200V +-10%/5% CERAMIC NPO	
39	4	C3,C6,C21,C22	151-0028	270PF 100V/200V +-5% CERAMIC NPO	
40	1	C43	151-0080	.0022UF 100V +-10% CERAMIC X7R	
41	13	C9,C11,C16,C20,C33, C39,C41,C42,C44,C46, C91,C95,C97	151-0181	.1UF 50V +-10% CERAMIC X7R	
42	1	C26	152-0085	.01 UF 50V +- 5% POLYESTER	

43	1	C25	152-0088	.0047UF 50V +-5% POLYESTER	
44	23	C1,C2,C8,C10,C12, C13,C14, C15,C19,C24, C28,C29,C30,C36,C37, C62,C70,C82,C89,C104, C105,C106,C107	154-0025	1 UF 35V TANTALUM +- 10%	
45	9	C18,C23,C66,C87, C92,C96, C98,C100, C102	155-0052	10 UF 35V +-20% RADIAL ALUMINUM ELECTROLYTIC	
46	1	C47	155-0055	22 UF 35V +-20% AXIAL ALUMINUM ELECTROLYTIC	
47	4	C85,C90,C93,C94	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
48	48	E1,E2,E3,E4,E5,E6, E7,E8,E9,E10,E11,E12, E13,E14,E15,E16,E17, E18,E19,E20,E21,E22, E23,E24,E25,E26,E27, E28,E29,E30,E31,E32, E33,E34,E35,E36,E37, E38,E39,E40,E41,E42, E43,E44,E48,E49,E50,E51	305-0001	FERRITE BEADS W/ LEADS	
49	3	E45,E46,E47	305-0306	EMI SUPPRESSION FILTER	
50	1	VR2	316-0005	REGULATOR 5V LOW POWER	78L05
51	1	U45	316-0232	RS232 DRIVER CMOS +5V POWER	232
52	9	U1,U2,U3,U4,U5,U6, U8,U10,U44	316-0353	OP, AMP DUAL BIFET	353
53	1	U7	316-0662	OP-AMP, CMOS, DUAL	C662
54	1	VR1	316-2940	REGULATOR, +5V, LOW DROPOUT	2940
55	1	U13	316-7705	POWER ON RESET	TL7705
56	1	VR3 **NOTE 3**	316-7805	REGULATOR, +5V 1.5A	7805
57	2	U16,U19	317-1489	QUAD RS-232 RECEIVER	1489
58	0	U15^	321-6805	ASIC 008	ASIC 008
59	1	U23	321-6813	UP-HC, NON-MUX W/CS	68HC11F1
60	1	U40	321-6851	UART 2MHZ	68B50
61	1	U27	321-8256	SRAM, 32K X 8, 100NS, 50UA FROM 0-70C	32KX8
62	1	U12	323-4052	DUAL 4-CHAN ANALOG MUX	4052
63	2	U9,U11	323-4053	ANALOG SWITCH, TRIPLE SPDT	4053
64	2	U21,U22	323-4906	HEX LEVEL SHIFT	74C906
65	0	U29^	323-8256	32K X 8 FLASH EPROM	28F256
66	2	U17,U26	324-4125	TRI-STATE QUAD BUFFER	74HC125
67	3	U28,U32,U37	324-4138	DECODER 1 OF 8	74HC138
68	1	U33	324-4373	OCTAL LATCH	74HC373
69	1	U20	324-4393	DUAL 4 BIT COUNTER	74HC393
70	2	U31,U34	324-7400	QUAD NAND	74HC00
71	1	U18	324-7408	QUAD 2 IN AND	74HC08
72	2	U30,U35	324-7414	HEX SCHMIDT	74HC14
73	1	U43	325-4244	OCTAL BUFFER	74HCT244
74	1	U38	325-4245	OCTAL XCVR	74HCT245
75	5	U14,U24,U25,U36,U39	325-4273	OCTAL DFF	74HCT273
77	1	Q1	340-0201	XSTR,JFET,N-CHANNEL,VGS > -1.5,TO-92	J201
76	2	U42,U41	340-2003	RELAY DRIVER 50V/.5A	2003
78	1	Q2	340-3906	PNP 40V/200MA, TO92	2N3906
79	1	Q3	340-5460	JFETP-CHAN, 40V, 5MA, TO92	2N5460
80	2	CR2,CR3	342-3009	DIODE, SILICON 100V 250MW	1N4148
81	6	CR12,CR13,CR14, CR15,CR16,CR17	342-3011	DIODE, SIL 1A 1KV	1N4007
82	6	CR5,CR6,CR7,CR8, CR9,CR10	342-5400	DIODE, SIL 3A 50V	1N5400
83	1	CR4	343-3029	1W 5.1V +-5% MOTOROLA ONLY	1N4733A
84	1	CR11	343-3108	ZENER, 15V 1W +-5%	1N4744A
85	1	SW1 **NOTE 2**	371-0012	SPDT .1 CENTERS	
86	1	Y1 **NOTE 1**	376-0800	XTAL, 8.000MHZ, HC-49 CL=SERIES	8.000MHZ
87	5	K1,K2,K3,K4,K5	380-0030	DPDT 12V COIL MINI RELAY 360 OHM	
88	1	P1	401-0059	HEADER, 15-POS R/A 0.200"	
89	1	J16	401-0060	3-POS TERM BLK	
90	7	J6,J7,J8,J9,J10, J11,J12	401-0063	50 PIN CARD EDGE	
91	1	J13	401-0080	6-PIN LO PRO R/A TELCO	
92	3	J2,J3,J4	401-0206	50 PIN RJ21 CONN MALE	
93	1	J5	401-0217	5 PIN DIN	
94	1	J1	401-0664	CONN, D-SUB, 9-PIN FEMALE, PC-R/A METAL, 590	
95	1	P7	401-1101	14 POS HEADER	
96	3	P9,P10,P11	401-2421	CONN, LOCKING HEADER, 24 POS	
97	1	P8	401-3592	10-POS BLOCK MALE VERT	
98	3	J14,J15,J17	401-5202	4 PIN TELCO, RT ANGLE	
99	4	P3,JP8,JP9,P12	403-0002	2 OF 401-0052	

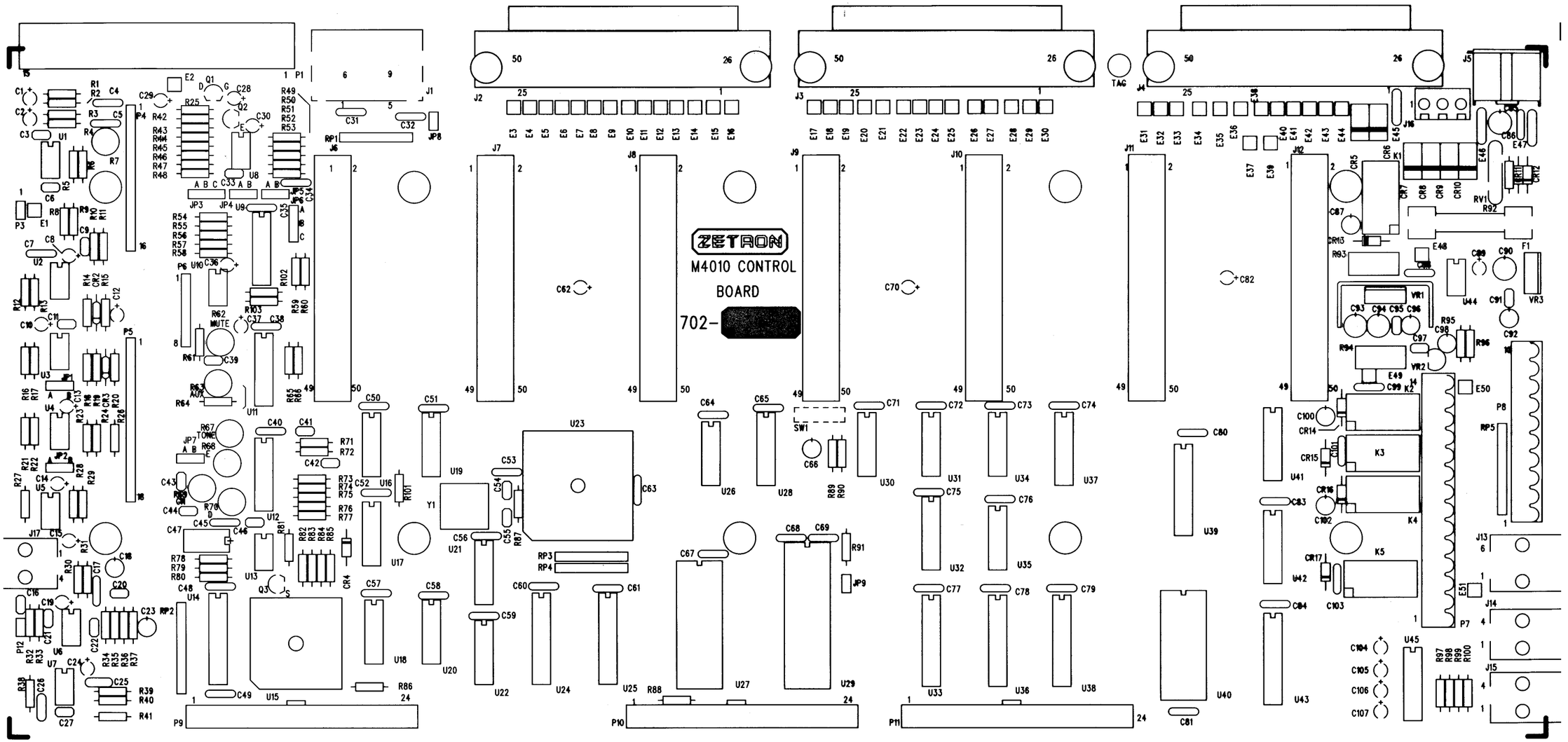
Model 4010 Radio Dispatch Console Service Manual

100	5	JP1,JP2,JP4,JP5,JP7	403-0003	3 OF 401-0052	
101	2	JP3,JP6	403-0004	4 OF 401-0052	
102	1	P6	403-0008	8 OF 401-0052	
103	1	P4	403-0016	16 OF 401-0052	
104	1	P5	403-0018	18 OF 401-0052	
105	1	F1	416-6025	FUSE 2.5A SLO-BLOW SPIRAL WOUND	2.5A
106	1	XVR1	210-0001	NUT,KEP, 4-40, S-ZN	
107	6	XJ2,3, 4 **(2 EA)**	220-0106	4-40 X 5/16 PAN HD PHIL	
108	2	XVR1,3	220-0108	4-40 X 1/4 PAN HD PHIL	
109	1	XVR3 **NOTE 3**	234-0007	#4 TEFLON SHOULDER WASHER	
110	1	XVR3 **NOTE 3**	236-0001	MICA WASHER TO-220	
111	1	XVR3 **NOTE 3**	251-1239	#4 X .032 FIBER WASHER	
112	1	XVR1	381-0003	HEATSINK, TO-220, SMALL STAMPING	
113	13	XJP1-7 **(POS A)** XP4 **(PINS 1-2,3-4,5-6,7-8)** XP5,6 **(PINS 1-2)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
114	11	XU1-8,10,13,44	407-0008	SKT, 08 PIN DIP	
115	12	XU16-22,26,30,31, 34,35	407-0014	SKT, 14 PIN DIP	
116	9	XU9,11,12,28,32, 37,41,42,45	407-0016	SKT, 16 PIN DIP	
117	8	XU14,24,25,33,36, 38,39,43	407-0020	SKT, 20 PIN DIP	
118	1	XU40	407-0024	SKT, 24 PIN DIP	
119	1	XU27	407-0028	SKT, 28 PIN DIP	
120	1	XU29	407-0032	SKT, 32 PIN DIP	
121	1	XU15	407-0044	SKT, 44 PIN PLCC	
122	1	XU23	407-0068	SKT, 68 PIN PLCC	
123	1	PCB, BARE	410-9376C	M4010 CONTROL BOARD, PCB	
124	1	XVR3 **NOTE 3**	415-9597A	M4010 REGULATOR HEATSINK	
125	1	XU27	416-1217	28 PIN BATT/WATCH 8K/32K	DS1216C
126	2	XF1	416-3040	FUSE CLIP	

REFERENCE DESIGNATORS NOT USED: P2,CR1

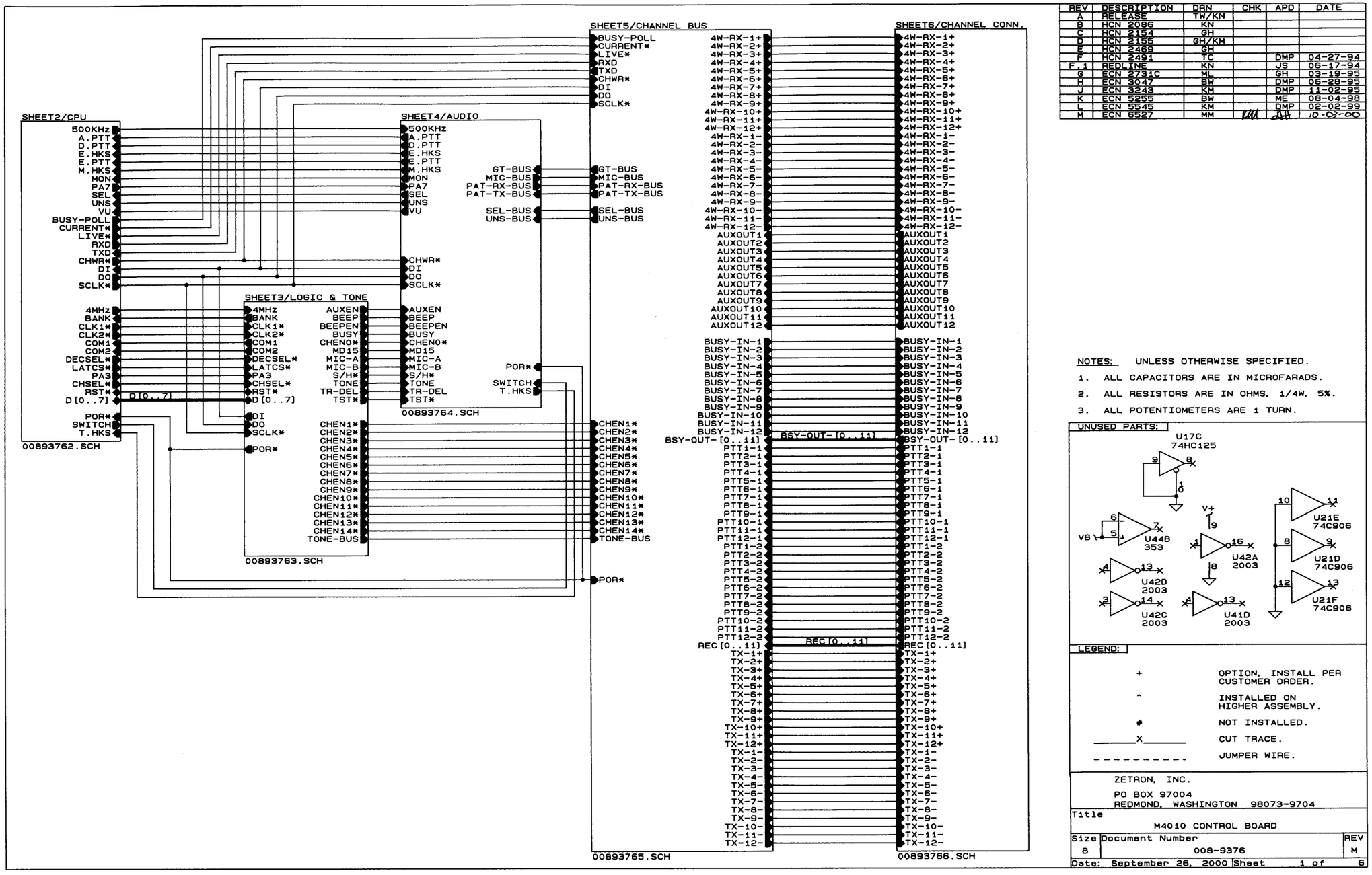
NOTES: (Notes are for production use only.)

Control Board Silkscreen



Model 4010 Radio Dispatch Console Service Manual

Control Board Schematic (008-9376M)



REV	DESCRIPTION	DRN	CHK	APD	DATE
A	RELEASE	TW/KN			
B	HCN 2086	KN			
C	HCN 2154	GH			
D	HCN 2155	GH/KM			
E	HCN 2469	GH			
F	HCN 2491	TC		DMP	04-27-94
F.1	REDLINE	KN		JS	06-17-94
G	ECN 2731C	ML		GH	03-19-95
H	ECN 3047	BW		DMP	06-28-95
J	ECN 3243	KM		DMP	11-02-95
K	ECN 5255	BW		ME	08-04-98
L	ECN 5545	KM		DMP	02-02-99
M	ECN 6527	MM			10-03-00

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL CAPACITORS ARE IN MICROFARADS.
2. ALL RESISTORS ARE IN OHMS, 1/4W, 5%.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

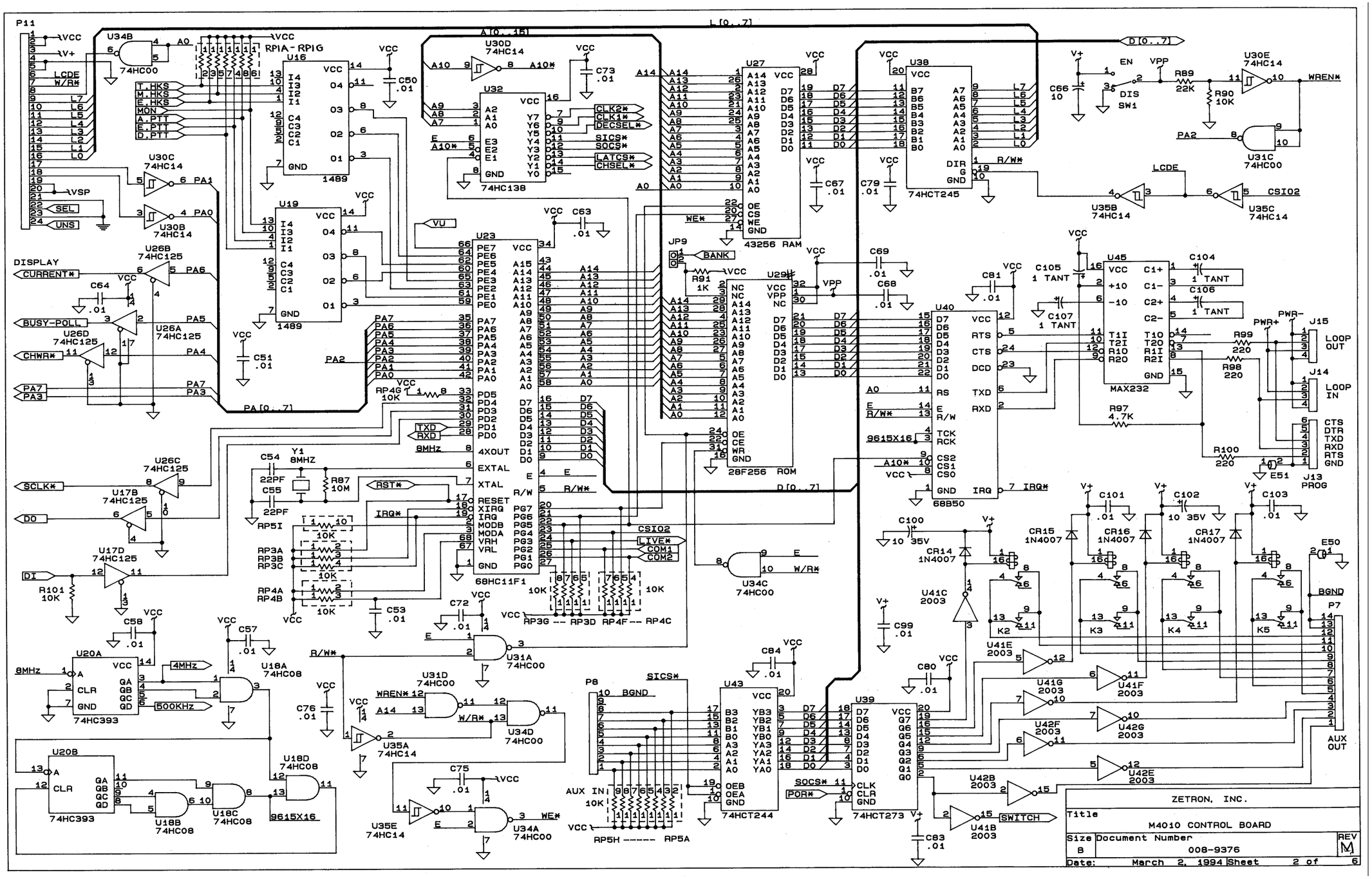
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
——X——	CUT TRACE.
- - - - - - - - - -	JUMPER WIRE.

ZETRON, INC.
PO BOX 97004
REDMOND, WASHINGTON 98073-9704

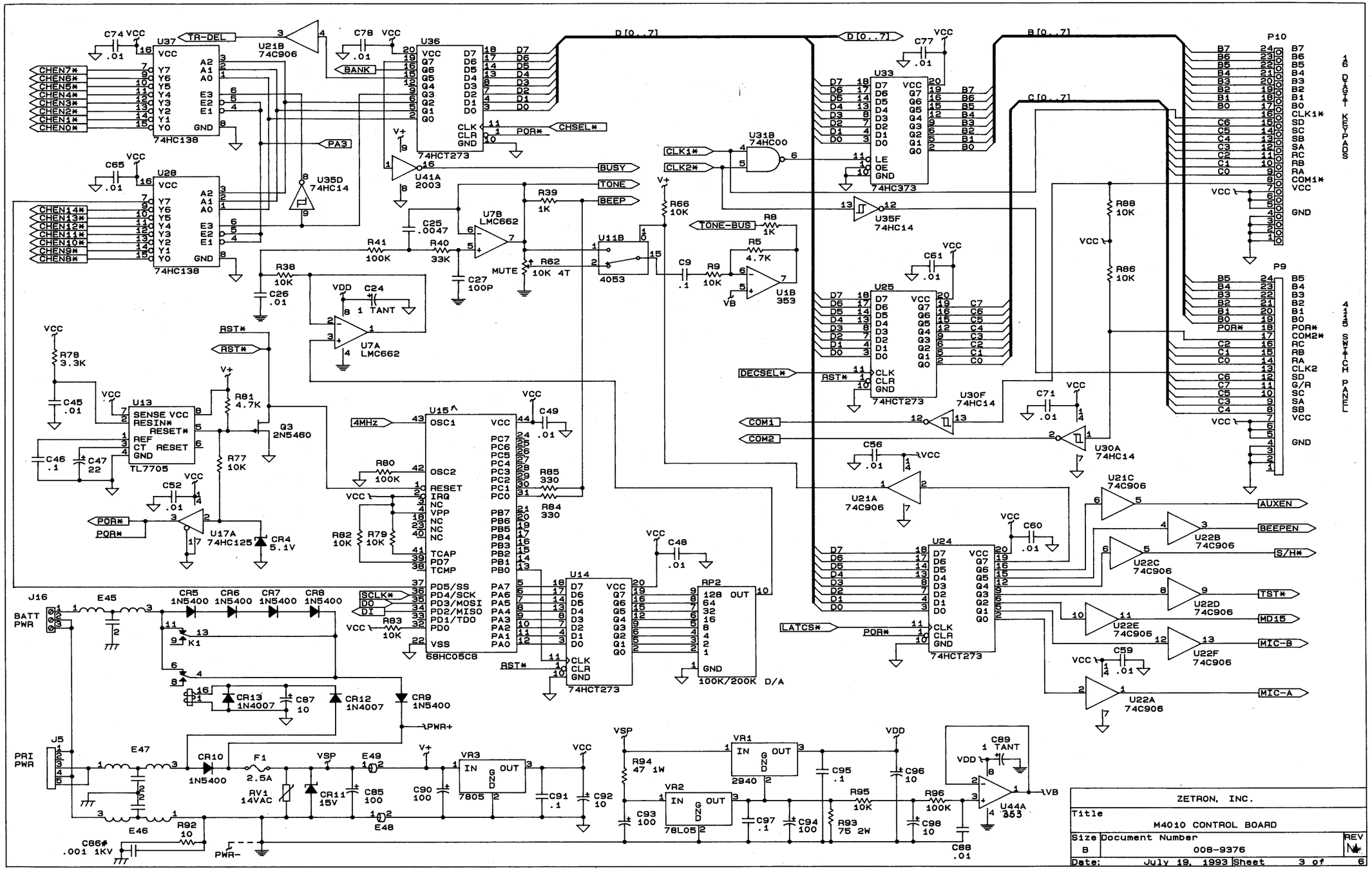
Title: M4010 CONTROL BOARD

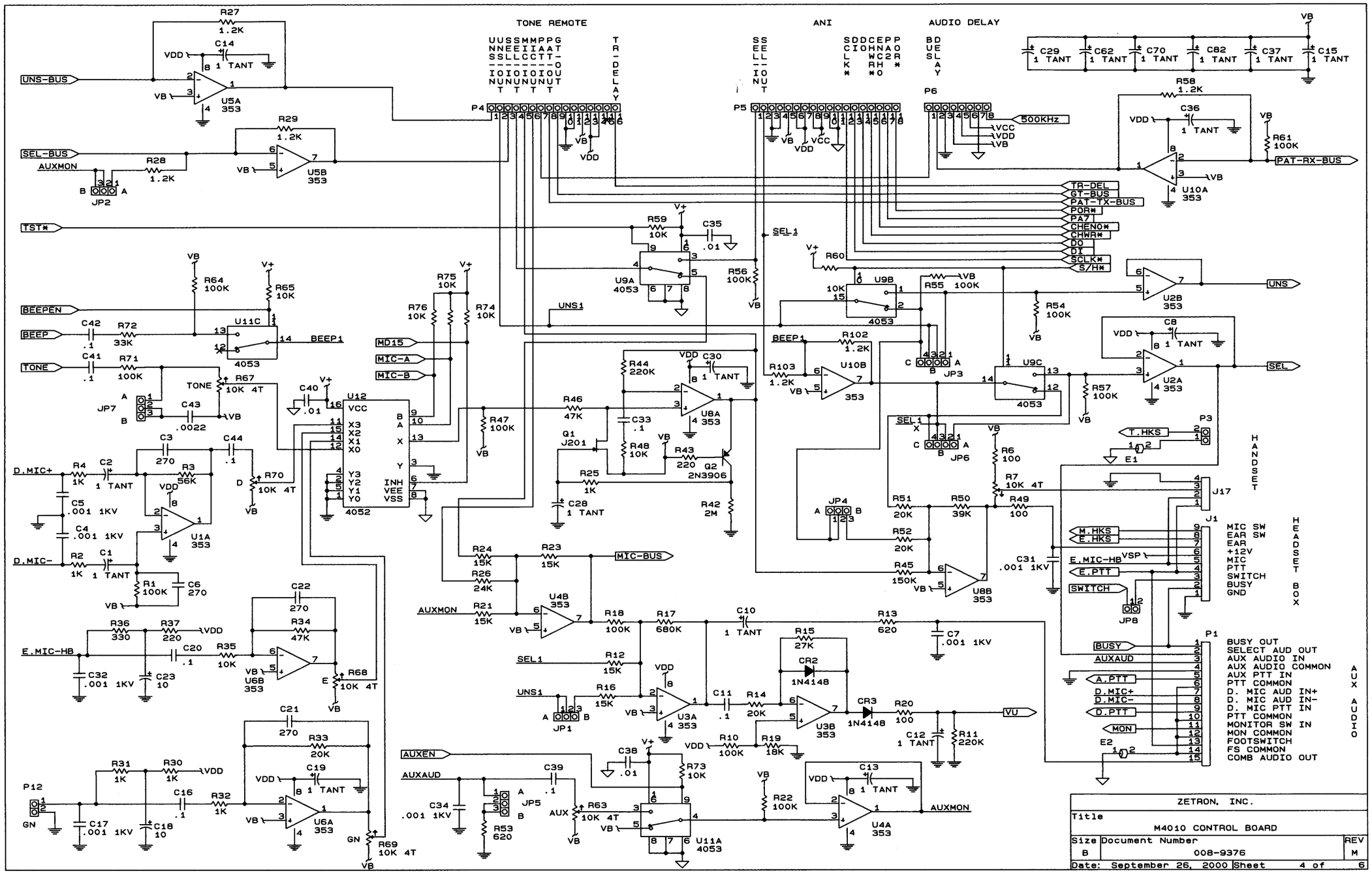
Size	Document Number	REV
B	008-9376	M

Date: September 26, 2000 Sheet 1 of 6

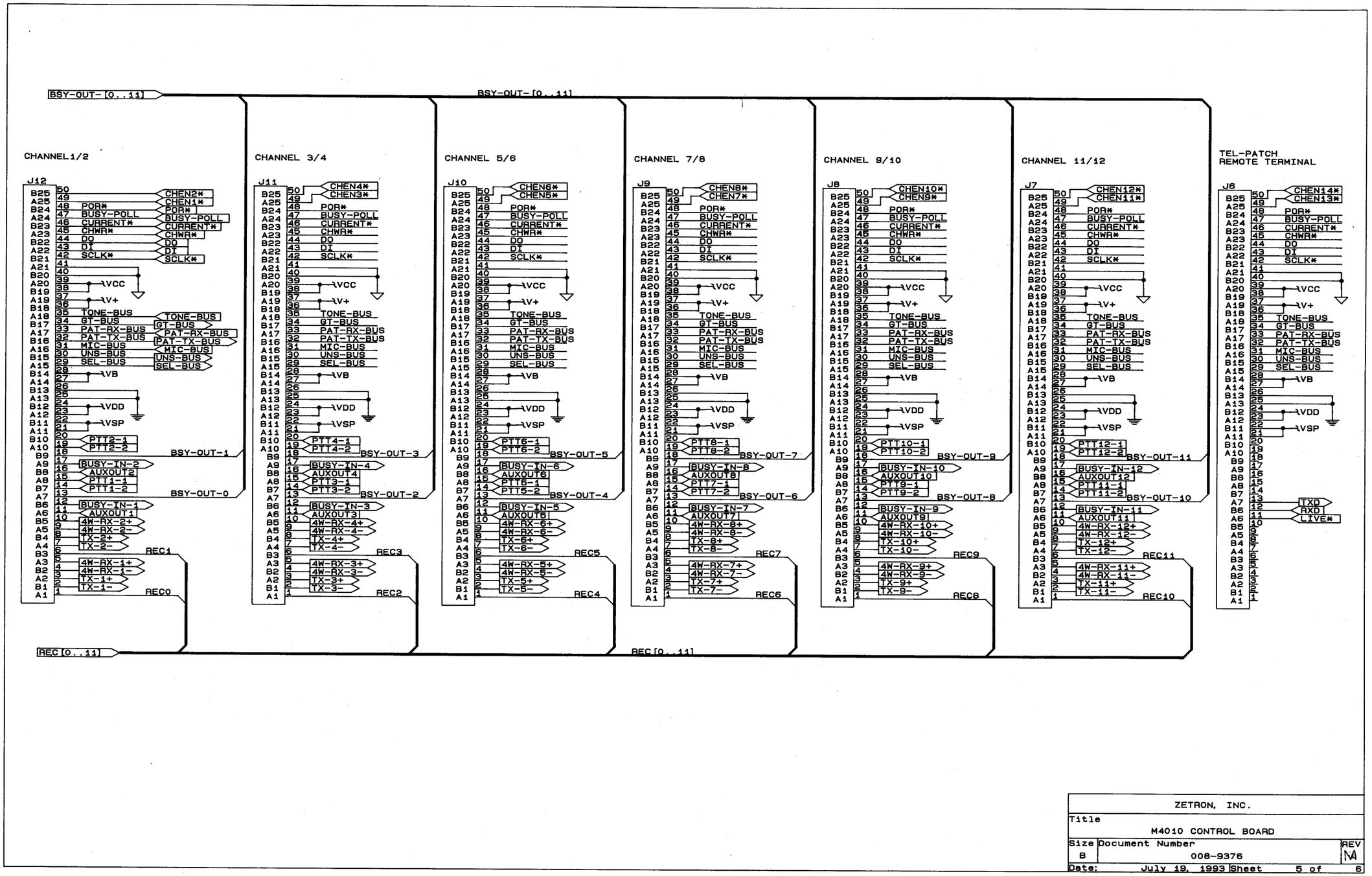

P11
U34B
74HC00
RP1A-RP1G
U16
1489
U19
1489
U30C
74HC14
U30B
74HC14
U26B
74HC125
U26D
74HC125
U26A
74HC125
U26C
74HC125
U17B
74HC125
U17D
74HC125
U30D
74HC14
U32
74HC138
U27
43256 RAM
U38
74HCT245
U30E
74HC14
U31C
74HC00
U35B
74HC14
U35C
74HC14
U23
68HC11F1
U29
28F256 ROM
U40
68B50
U45
MAX232
U20A
74HC393
U20B
74HC393
U18A
74HC08
U18B
74HC08
U18C
74HC08
U18D
74HC08
U31A
74HC00
U31D
74HC00
U34D
74HC00
U34C
74HC00
U34A
74HC00
U35A
74HC14
U35E
74HC14
U43
74HCT244
U39
74HCT273
U41C
2003
U41E
2003
U41F
2003
U41G
2003
U42F
2003
U42G
2003
U42B
2003
U42E
2003
U41B
2003
J15
LOOP OUT
J14
LOOP IN
J13
PROG
P7
AUX OUT
P8
RP5H ----- RP5A
RP3G -- RP3D RP4F -- RP4C
ZETRON, INC.
M4010 CONTROL BOARD
008-9376
March 2, 1994
Sheet 2 of 6

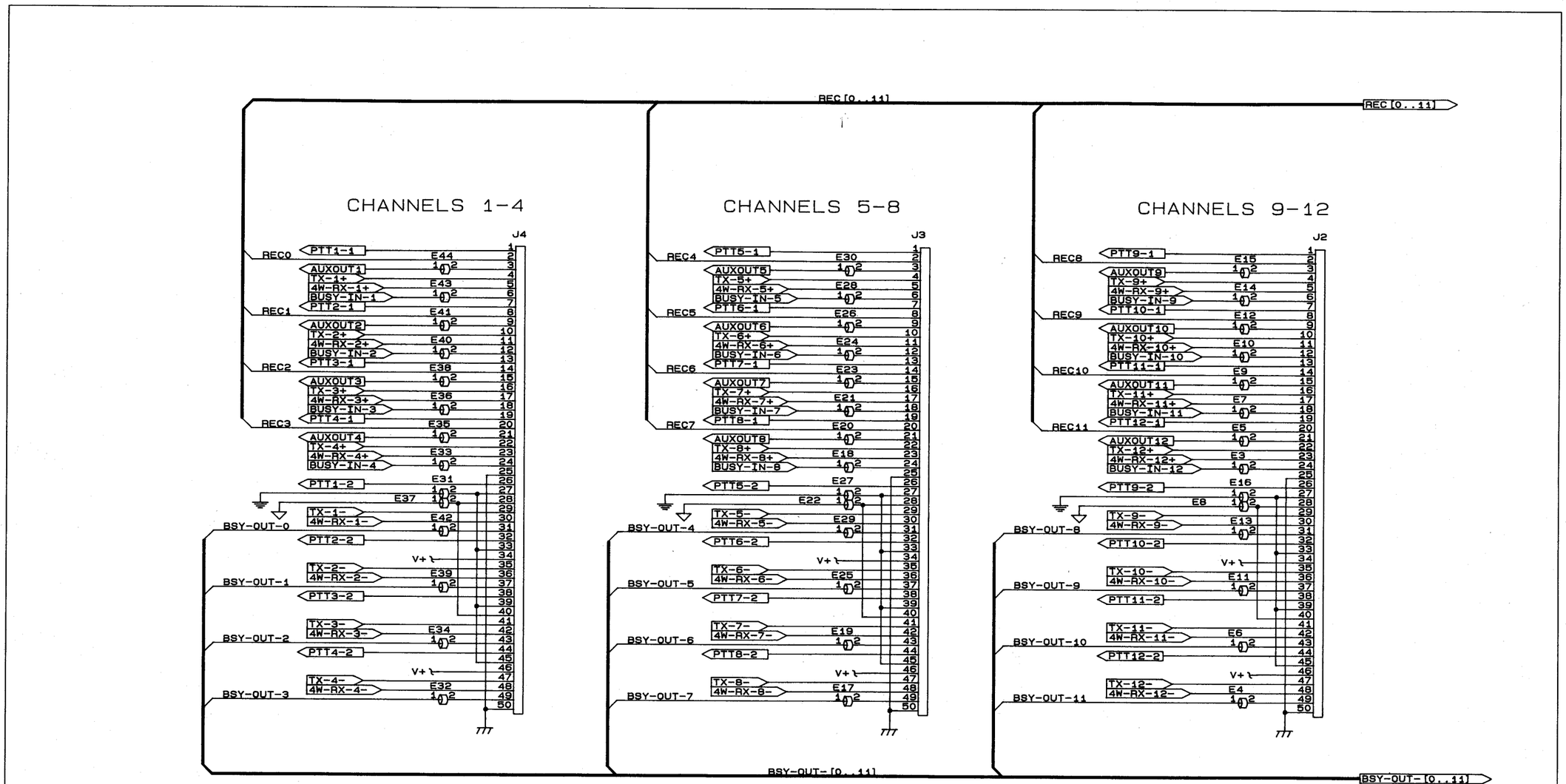
Model 4010 Radio Dispatch Console Service Manual




TONE REMOTE
ANI
AUDIO DELAY
UNS-BUS
SEL-BUS
AUXMON
TST*
BEEPEN
BEEP
TONE
D.MIC+
D.MIC-
E.MIC-HB
GN
MD15
MIC-A
MIC-B
MIC-BUS
AUXEN
AUXAUD
UNS1
SEL1
BEEP1
VU
UNS
SEL
PAT-RX-BUS
TR-DEL
GT-BUS
PAT-TX-BUS
PDR*
PA7
CHENO*
CHWR*
DO
DI
SCLK*
S/H*
500KHz
VCC
VDD
VB
V+
T.HKS
M.HKS
E.HKS
E.MIC-HB
E.PTT
SWITCH
BUSY
A.PTT
D.MIC+
D.MIC-
D.PTT
MON
VSP
HANDSET
MIC SW
EAR SW
EAR
+12V
MIC
PTT
SWITCH
BUSY
GND
HEADSET BOX
BUSY OUT
SELECT AUD OUT
AUX AUDIO IN
AUX AUDIO COMMON
AUX PTT IN
PTT COMMON
D. MIC AUD IN+
D. MIC AUD IN-
D. MIC PTT IN
PTT COMMON
MONITOR SW IN
MON COMMON
FOOTSWITCH
FS COMMON
COMB AUDIO OUT
AUX AUDIO
ZETRON, INC.
Title
M4010 CONTROL BOARD
Size B
Document Number 008-9376
REV M
Date: September 25, 2000
Sheet 4 of 6

Model 4010 Radio Dispatch Console Service Manual





ZETRON, INC.		
Title: M4010 CONTROL BOARD		
Size: B	Document Number: 008-9376	REV: A
Date: July 19, 1993	Sheet 6 of 6	

Display Board Parts List (702-9378E)

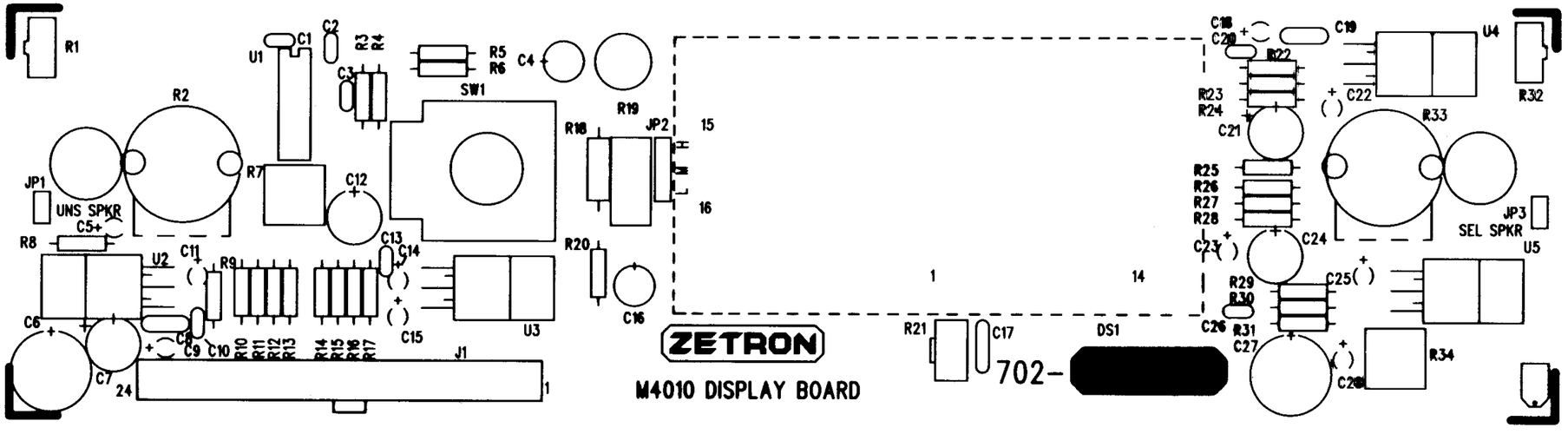
LEGEND:
+ = OPTION
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY

ZETRON M4010 DISPLAY BOARD PARTS LIST (702-9378E)

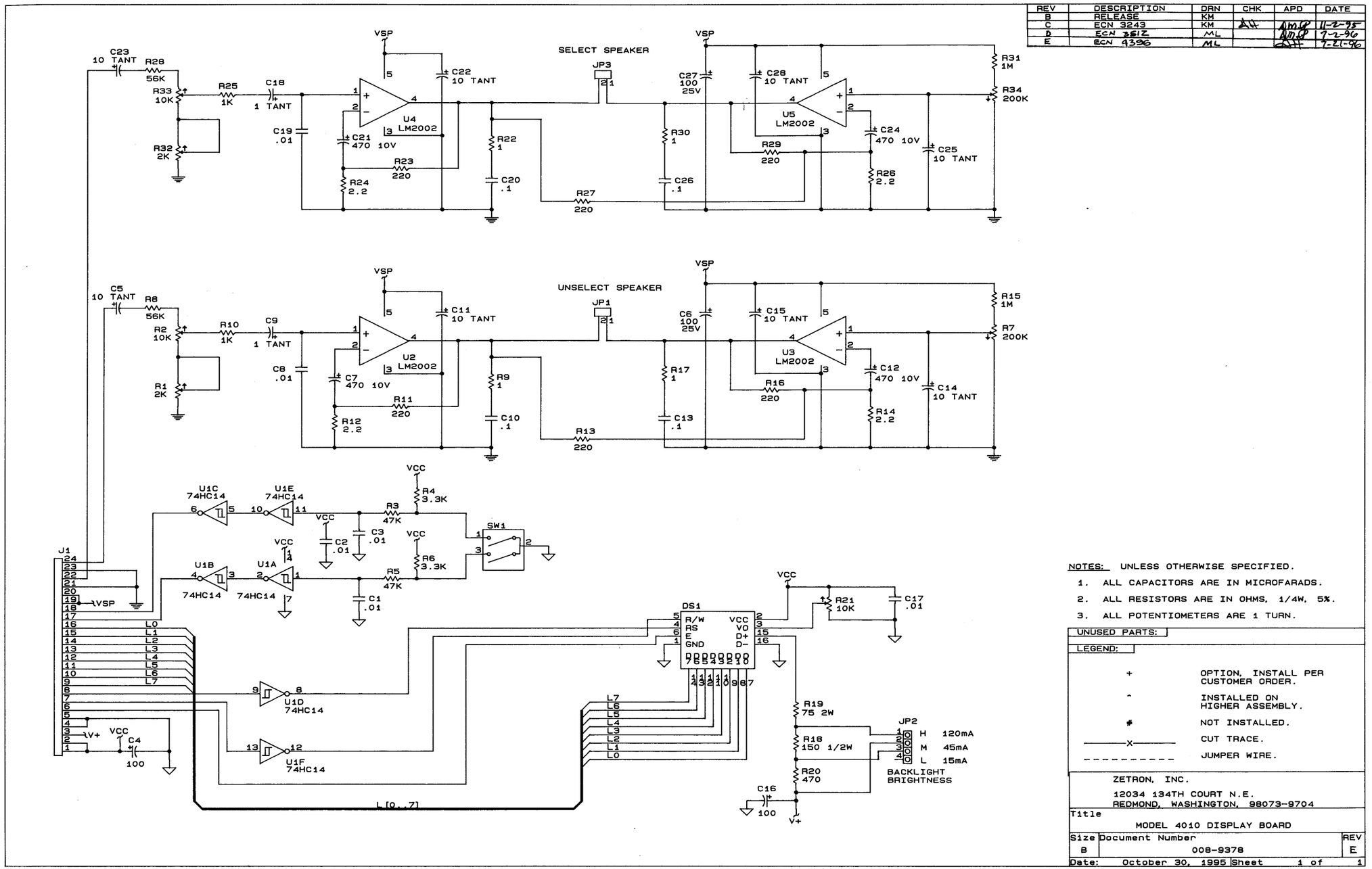
Item	Qty	Reference	Part	Description	Mfg.Part No.
1	4	R9,R17,R22,R30	101-0010	1.O OHM 1/4W 5% CARBON FILM	
2	4	R12,R14,R24,R26	101-0013	2.2 OHM 1/4W 5% CARBON FILM	
3	6	R11,R13,R16,R23, R27,R29	101-0057	220 OHM 1/4W 5% CARBON FILM	
4	1	R20	101-0065	470 OHM 1/4W 5% CARBON FILM	
5	2	R10,R25	101-0073	1.OK 1/4W 5% CARBON FILM	
6	2	R6,R4	101-0085	3.3K 1/4W 5% CARBON FILM	
7	2	R5,R3	101-0113	47K 1/4W 5% CARBON FILM	
8	2	R28,R8	101-0115	56K 1/4W 5% CARBON FILM	
9	2	R15,R31	101-0145	1.0M 1/4W 5% CARBON FILM	
10	1	R18	102-0052	150 OHM 1/2W 5% CARBON FILM	
11	1	R19	103-0175	RESISTOR, 75 OHM 2W 5%	
12	2	R2,R33	107-0002	POT, 10K ROTORY POT, LINEAR TAPER	
13	2	R1,R32	107-0003	2K POT 1 TURN R/A	
14	1	R21	107-0010	10K POT 1 TURN R/A	
15	2	R7,R34	107-0504	200K POT 1 TURN	
16	1	C17	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	
17	3	C1,C2,C3	151-0120	.01UF 50V/100V +-10% CERAMIC X7R	
18	4	C10,C13,C20,C26	151-0181	.1UF 50V +-10% CERAMIC X7R	
19	2	C8,C19	152-0085	.01 UF 50V +- 5% POLYESTER	
20	2	C18,C9	154-0025	1 UF 35V TANTALUM +- 10%	
21	8	C5,C11,C14,C15,C22, C23,C25,C28	154-0100	10 UF 16V TANTALUM +-10%	
22	2	C4,C16	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
23	4	C7,C12,C21,C24	155-0083	470 UF 10 VOLT RADIAL ALUMINUM ELECTROLYTIC	
24	2	C6,C27	155-0090	1000 UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
25	1	DS1 **NOTE 1**	311-1621	DISPLAY, LCD, 16 X 2 CHAR BACKLIGHT	
26	4	U2,U3,U4,U5	316-2003	8W AUDIO AMP HORIZ MOUNT	LM383
27	1	U1	324-7414	HEX SCHMIDT	74HC14
28	1	SW1	371-0015	ROTARY ENCODER WITH 1/4" SHAFT	
29	1	J1	401-2421	CONN, LOCKING HEADER, 24 POS	
30	1	JP2	403-0004	4 OF 401-0052	
31	2	JP3,JP1	404-1002	2 OF 401-1364	
32	2	XDS1 **NOTE 1**	210-0006	2-56 NUT	
33	2	XDS1 **NOTE 1**	220-0012	256x1/2 PAN HEAD SLOTTED	
34	2	XDS1 **NOTE 1**	234-0003	#2 SPLIT LOCK WASHER	
34.5	2	XDS1 **NOTE 1**	251-1239	440x.031 FIBER WASHER	
35	4	XDS1 **NOTE 1**	251-1240	440x.062 FIBER WASHER	
36	1	XJP2 (POS H)	402-3040	MINI JUMPER	
37	2	XDS1 (PINS 15,16)	403-0001	1 OF 401-0052	
38	1	XDS1 (PINS 1-14)	403-0014	14 OF 401-0052	
39	1	XU1	407-0014	SKT, 14 PIN DIP	
40	1	PCB	410-9378C	M4010 DISPLAY BOARD	

NOTES: (Notes are for production use only.)

Display Board Silkscreen



Display Board Schematic (008-9378E)



Keypad Board Parts List (702-9379C.3)

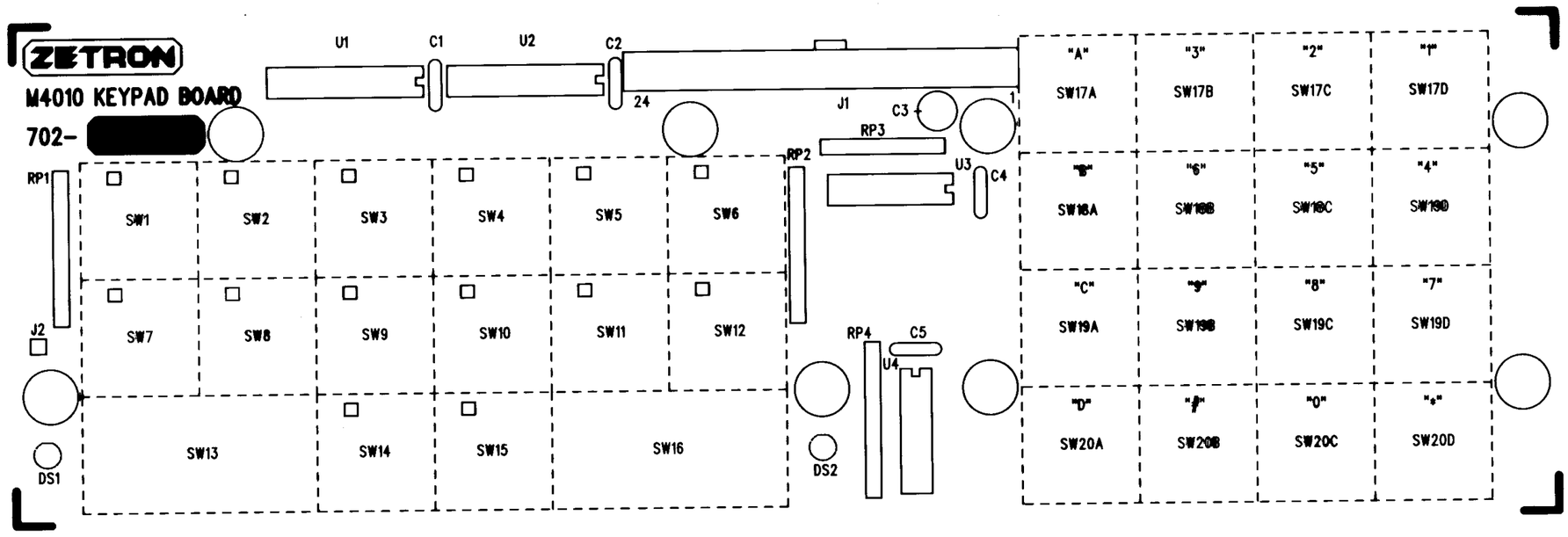
LEGEND:
+ = OPTION
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY

ZETRON M4010 KEYPAD BOARD PARTS LIST (702-9379C.3)

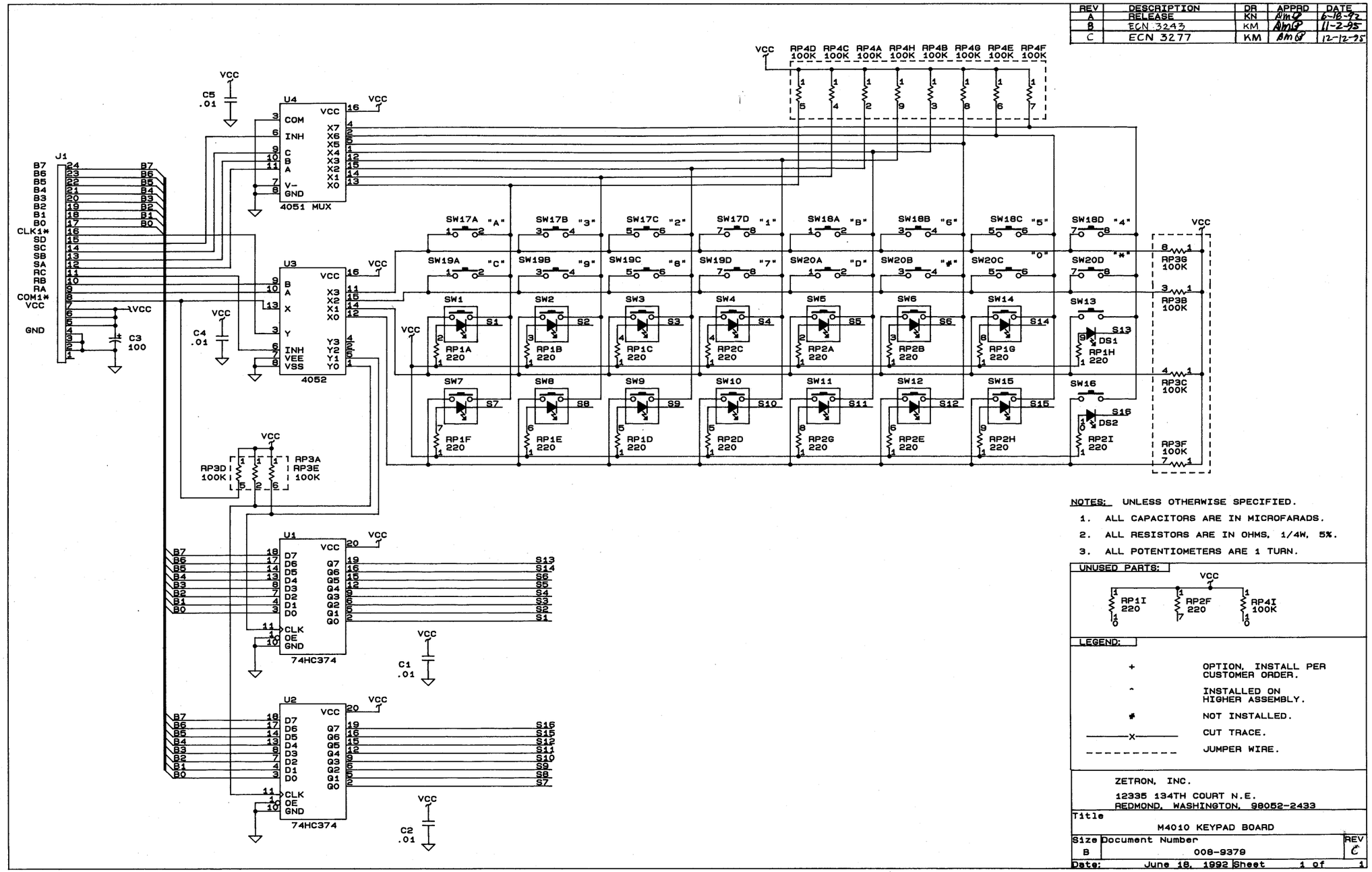
Item	Qty	Reference	Part	Description	Mfg.Part No.
1	1	RP3	119-0007	100K x 7 BUSSED 8-PIN SIP	
2	2	RP1,RP2	119-0011	220 x 9 BUSSED 10-PIN SIP	
3	1	RP4	119-0015	100K x 9 BUSSED 10-PIN SIP	
4	4	C1,C2,C4,C5	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	
5	1	C3	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
6	2	DS2,DS1 **NOTE 1**	311-0022	LED RED, T-1	
7	1	U4	323-4051	1-TO-8 ANALOG MUX/DEMUX	4051
8	1	U3	323-4052	DUAL 4-CHAN ANALOG MUX	4052
9	2	U1,U2	324-4374	OCTAL DFF REG	74HC374
10	1	J1	401-2421	CONN, LOCKING HEADER, 24 POS	
11	29	XSW1-20 **NOTE 1**	220-0075	#3 X 5/16 SELF-TAP TYPE 25, PAN HD PHIL	
12	2	XDS1,2	251-1250	440 X 1/8 SPACER	
13	14	XSW1-12,14,15	311-4222	LED RED, T-1 TRANSPARENT	
14	16	XSW1-16	373-1100	CT 1X1 LED/KEY HOUSING	11-A2-0008-01-0000
15	4	XSW17,18,19,20	373-1101	CT 1X4 KEY HOUSING	11-A2-0001-04-0000
16	32	XSW1-16 (1 EA) XSW17-20 (4 EA)	373-1102	CT KEY PLUNGER	
17	32	XSW1-16 XS17-20 (4 EA) **NOTES 2, 3**	373-1103	CT 1 X 1 KEYPAD ELASTOMER	
18	7"	**NOTE 6**	408-0012	22 GA BARE WIRE	
19	1	PCB	410-9379B	M4010 KEYPAD BOARD	

NOTES: (Notes are for production use only.)

Keypad Board Silkscreen



Keypad Board Schematic (008-9379C)



60-Button Panel Parts List (702-9432A)

LEGEND:
= NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

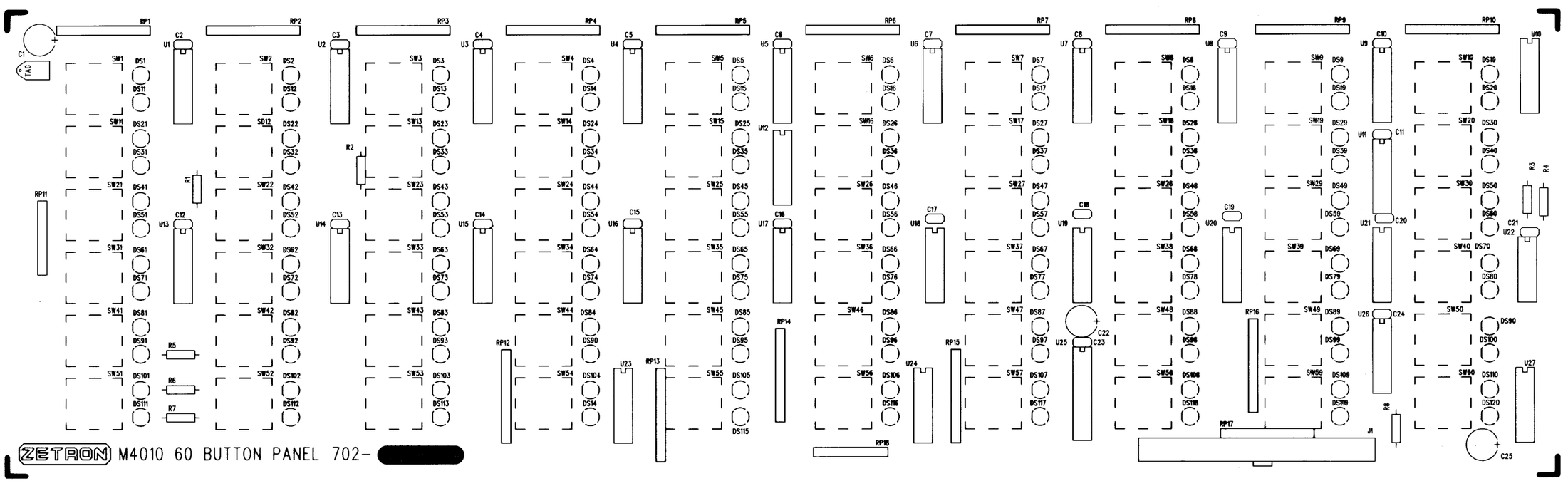
ZETRON MODEL 4010 60 BUTTON PANEL PART LIST (702-9432A)

Item	Qty	Reference	Part	Description	Mfg.Part No.
1	3	R5,R6,R7	101-0065	470 OHM 1/4W 5% CARBON FILM	
2	1	R8	101-0097	10K 1/4W 5% CARBON FILM	
3	4	R1,R2,R3,R4	101-0121	100K 1/4W 5% CARBON FILM	
4	3	RP13,RP15,RP17	119-0006	10K x 9 R-SIP	4610X-101-103
5	2	RP18,RP11	119-0007	100K x 7 R-SIP	4608X-101-104
6	13	RP1,RP2,RP3,RP4, RP5,RP6,RP7,RP8,RP9, RP10,RP12,RP14,RP16	119-0027	470 OHM X 9 R-SIP	
7	22	C2,C3,C4,C5,C6,C7, C8,C9,C10,C11,C12, C13,C14,C15,C16,C17, C18,C19,C20,C21,C23,C24	151-0120	.01 UF 50V +-10% CERAMIC, TEMP. STABLE	CW15C103K
8	3	C1,C22,C25	155-0083	470 UF 10 VOLT RADIAL ALUM. ELECT.	ECEA-1AU471
9	60	DS1,DS2,DS3,DS4, DS5,DS6,DS7,DS8,DS9, DS10,DS21,DS22,DS23, DS24,DS25,DS26,DS27, DS28,DS29,DS30,DS41, DS42,DS43,DS44,DS45, DS46,DS47,DS48,DS49, DS50,DS61,DS62,DS63, DS64,DS65,DS66,DS67, DS68,DS69,DS70,DS81, DS82,DS83,DS84,DS85, DS86,DS87,DS88,DS89, DS90,DS101,DS102,DS103, DS104,DS105,DS106,DS107, DS108,DS109,DS110,	311-0021	LED GREEN, T-1	LTL-4231
10	60	DS11,DS12,DS13,DS14, DS15,DS16,DS17,DS18, DS19,DS20,DS31,DS32, DS33,DS34,DS35,DS36, DS37,DS38,DS39,DS40, DS51,DS52,DS53,DS54, DS55,DS56,DS57,DS58, DS59,DS60,DS71,DS72, DS73,DS74,DS75,DS76, DS77,DS78,DS79,DS80, DS91,DS92,DS93,DS94, DS95,DS96,DS97,DS98, DS99,DS100,DS111,DS112, DS113,DS114,DS115,DS116, DS117,DS118,DS119,DS120	311-0022	LED RED, T-1	LTL-4221
11	4	U10,U12,U23,U24	323-4051	1-TO-8 ANALOG MUX/DEMUX	MC14051B
12	1	U27	323-4053	3PDT SWITCH	MC144053
13	1	U22	324-7400	QUAD NAND	MC74HC00
14	20	U1,U2,U3,U4,U5,U6, U7,U8,U9,U11,U13,U14, U15,U16,U17,U18,U19, U20,U21,U26	325-4174	HEX D. F/F	KS74HCT1174
15	1	U25	325-4244	OCTAL BUFFER	KS74HCT244
16	60	SW1,SW2,SW3,SW4, SW5,SW6,SW7,SW8,SW9, SW10,SW11,SW12,SW13, SW14,SW15,SW16,SW17, SW18,SW19,SW20,SW21, SW22,SW23,SW24,SW25, SW26,SW27,SW28,SW29, SW30,SW31,SW32,SW33, SW34,SW35,SW36,SW37, SW38,SW39,SW40,SW41, SW42,SW43,SW44,SW45, SW46,SW47,SW48,SW49,	371-0003	SINGLE KEY-NO LIGHT	JM2005#01

		SW50,SW51,SW52,SW53, SW54,SW55,SW56,SW57, SW58,SW59,SW60			
17	1	J1	401-2421	CONN, LOCKING HEADER, 24 POS	FPH-2421T
18	1	XU22	407-0014	SKT, 14 PIN DIP	
19	24	XU1,XU2,XU3,XU4, XU5,XU6,XU7,XU8,XU9, XU10,XU11,XU13,XU14, XU15,XU16,XU17,XU18, XU19,XU20,XU21,XU23, XU24,XU26,XU27	407-0016	SKT, 16 PIN DIP	
20	1	XU25	407-0020	SKT, 20 PIN DIP	
21	1	PCB	410-9432A	M4010 60 BUTTON PANEL	
22	10	XDS1-120	415-9536	LED SPACER	

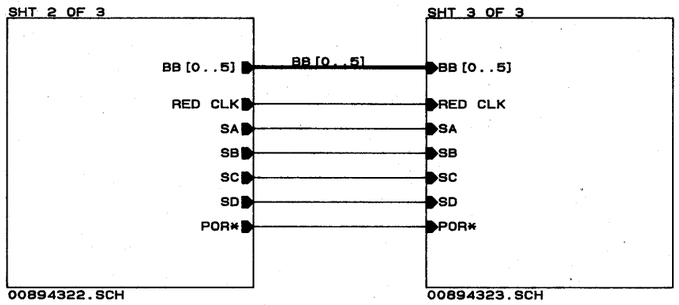
NOTES: (Notes are for production use only.)

60-Button Panel Silkscreen



60-Button Panel Schematic (008-9432A)

REV.	DESCRIPTION	DRN.	APVD.	DATE
A	RELEASE	DGW	DMP	6-18-92



NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTANCE MEASURED IN OHMS, 1/4W, +/- 5%.
2. ALL CAPACITANCE MEASIRED IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

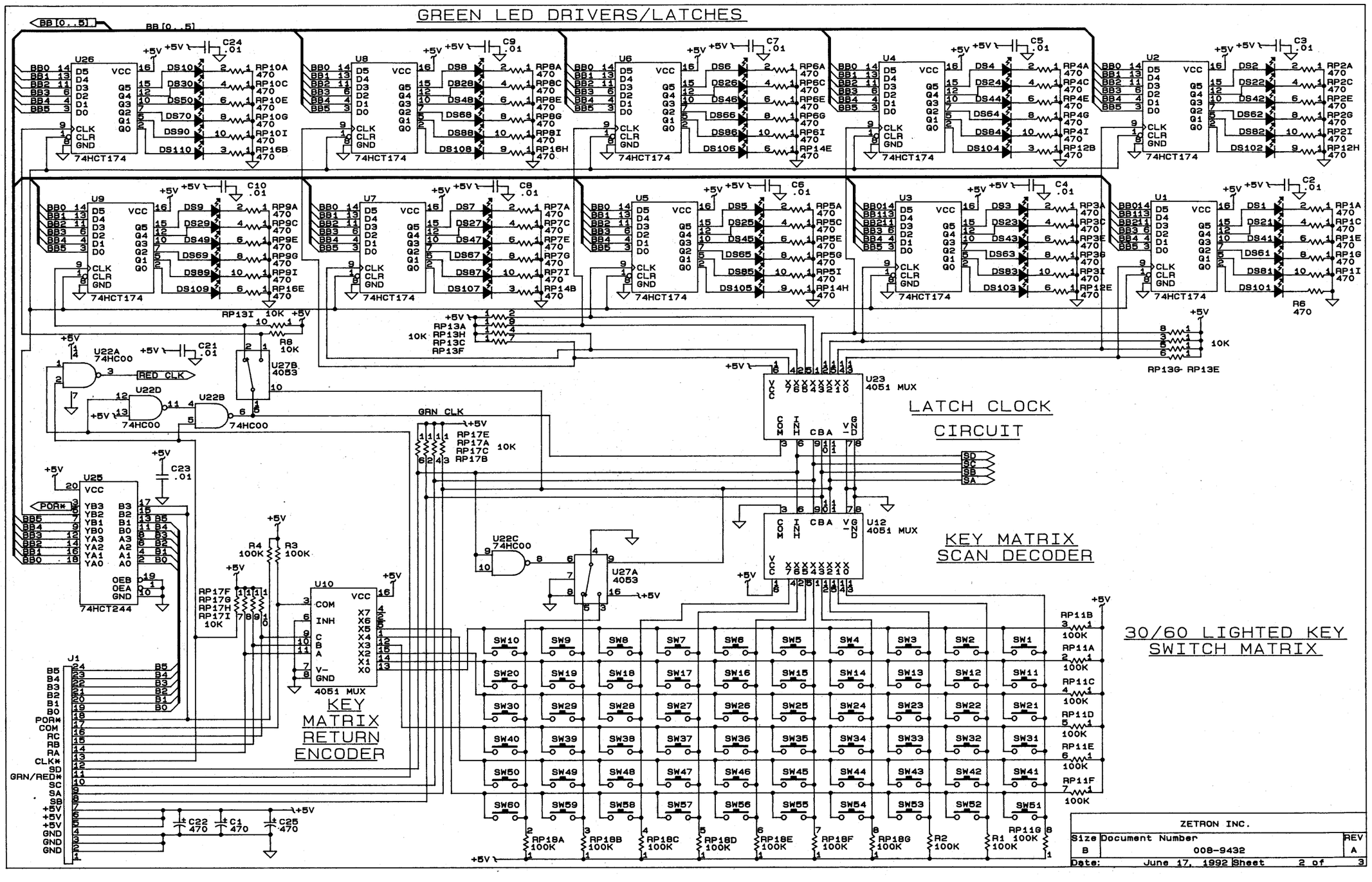
⏚	ANALOG GROUND
⏚	CHASSIS GROUND
⏚	DIGITAL GROUND
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
*	NOT INSTALLED.
——— x ———	CUT TRACE.
- - - - - - - - - -	JUMPER WIRE.

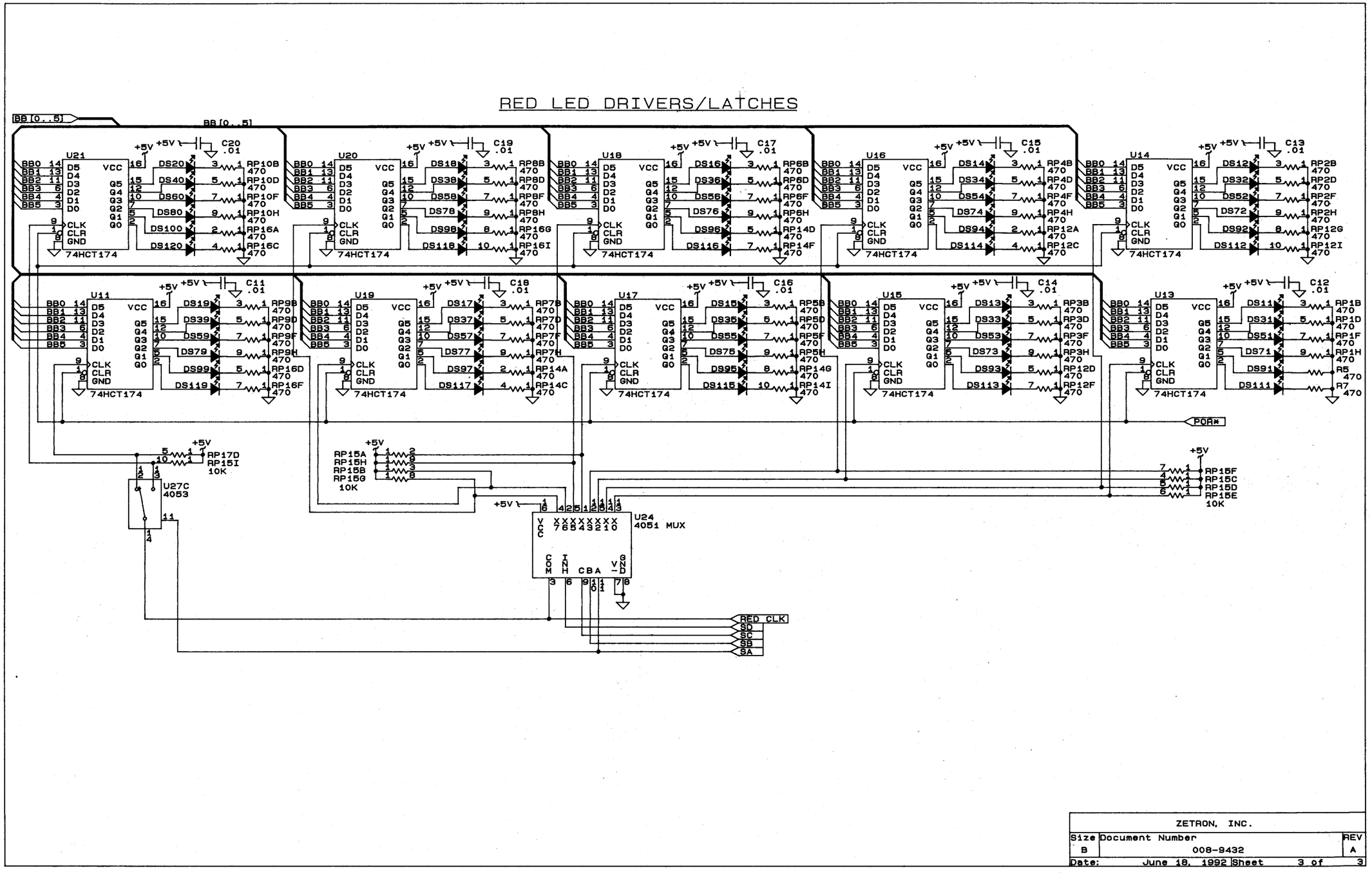
ZETRON, INC.
12335 134TH COURT N.E.
REDMOND, WASHINGTON, 98052-2433

Title: 4010 60 BUTTON PANEL

Size	Document Number	REV
B	008-9432	A

Date: March 23, 1992 Sheet 1 of 3


GREEN LED DRIVERS/LATCHES
BB[0..5]
U26
U8
U6
U4
U2
U9
U7
U5
U3
U1
74HCT174
C24 .01
C9 .01
C7 .01
C5 .01
C3 .01
C10 .01
C8 .01
C6 .01
C4 .01
C2 .01
+5V
RP10A 470
RP10C 470
RP10E 470
RP10G 470
RP10I 470
RP16B 470
RP8A 470
RP8C 470
RP8E 470
RP8G 470
RP8I 470
RP16H 470
RP6A 470
RP6C 470
RP6E 470
RP6G 470
RP6I 470
RP14E 470
RP4A 470
RP4C 470
RP4E 470
RP4G 470
RP4I 470
RP12B 470
RP2A 470
RP2C 470
RP2E 470
RP2G 470
RP2I 470
RP12H 470
RP9A 470
RP9C 470
RP9E 470
RP9G 470
RP9I 470
RP16E 470
RP7A 470
RP7C 470
RP7E 470
RP7G 470
RP7I 470
RP14B 470
RP5A 470
RP5C 470
RP5E 470
RP5G 470
RP5I 470
RP14H 470
RP3A 470
RP3C 470
RP3E 470
RP3G 470
RP3I 470
RP12E 470
RP1A 470
RP1C 470
RP1E 470
RP1G 470
RP1I 470
R6 470
RP13I 10K
R8 10K
RP13A RP13H RP13C RP13F 10K
RP13G- RP13E 10K
U22A 74HC00
U22D 74HC00
U22B 74HC00
U27B 4053
RED CLK
GRN CLK
U23 4051 MUX
LATCH CLOCK CIRCUIT
SD
SC
SB
SA
U25 74HCT244
POR*
C23 .01
RP17E RP17A RP17C RP17B 10K
U22C 74HC00
U27A 4053
U12 4051 MUX
KEY MATRIX SCAN DECODER
R4 100K
R3 100K
RP17F RP17G RP17H RP17I 10K
U10 4051 MUX
KEY MATRIX RETURN ENCODER
J1
COM
RC
RB
RA
CLK*
GRN/RED*
C22 470
C1 470
C25 470
GND
SW10 SW9 SW8 SW7 SW6 SW5 SW4 SW3 SW2 SW1
SW20 SW19 SW18 SW17 SW16 SW15 SW14 SW13 SW12 SW11
SW30 SW29 SW28 SW27 SW26 SW25 SW24 SW23 SW22 SW21
SW40 SW39 SW38 SW37 SW36 SW35 SW34 SW33 SW32 SW31
SW50 SW49 SW48 SW47 SW46 SW45 SW44 SW43 SW42 SW41
SW60 SW59 SW58 SW57 SW56 SW55 SW54 SW53 SW52 SW51
RP18A 100K RP18B 100K RP18C 100K RP18D 100K RP18E 100K RP18F 100K RP18G 100K R2 100K R1 100K RP11G 100K
RP11B 100K RP11A 100K RP11C 100K RP11D 100K RP11E 100K RP11F 100K
30/60 LIGHTED KEY SWITCH MATRIX
ZETRON INC.
Size B
Document Number 008-9432
REV A
Date: June 17, 1992 Sheet 2 of 3



ZETRON, INC.		
Size B	Document Number 008-9432	REV A
Date: June 18, 1992	Sheet 3 of 3	

DUAL CHANNEL OPTION 950-9715

Dual Channel Board Part List (702-9377L)

LEGEND:

+	=	OPTION, INSTALL PER CUSTOMER ORDER
#	=	NOT INSTALLED
^	=	INSTALLED ON HIGHER ASSY
=	=	SUBSTITUTE PART

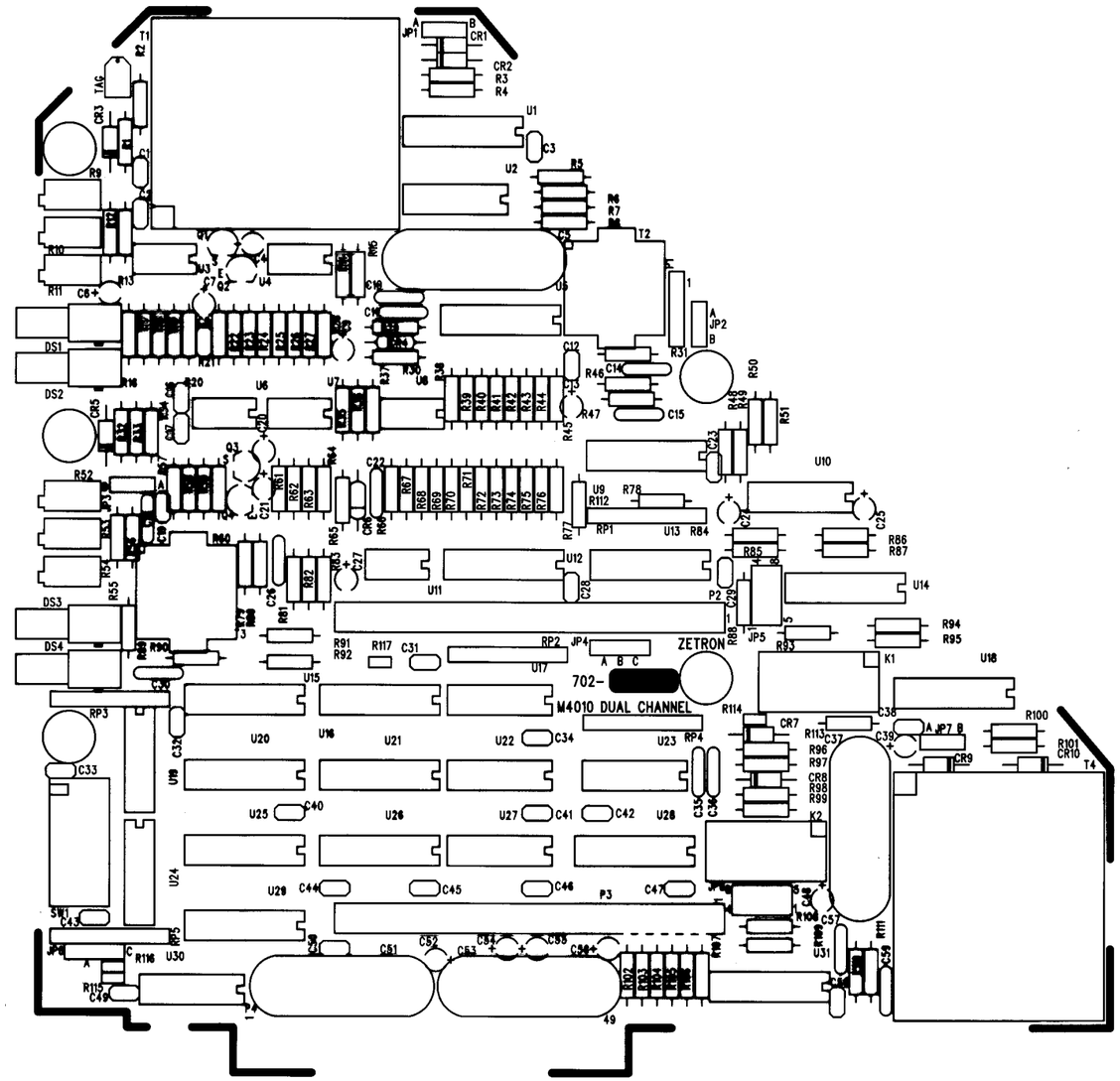
ZETRON MODEL 4010 DUAL CHANNEL BOARD PARTS LIST:

Item	Qty	Reference	Part	Description	Mfg.Part No.
1	4	R14,R15,R110,R111	101-0047	47 OHM 1/4W 5% CARBON FILM	
2	6	R3,R4,R22,R80,R100, R101	101-0057	220 OHM 1/4W 5% CARBON FILM	
3	2	R26,R64	101-0058	240 OHM 1/4W 5% CARBON FILM	
4	4	R47,R55,R66,R81	101-0068	620 OHM 1/4W 5% CARBON FILM	
5	12	R16,R31,R46,R56,R89, R90,R102,R103,R104, R105,R106,R107	101-0073	1.OK 1/4W 5% CARBON FILM	
6	2	R17,R92	101-0080	2.0K 1/4W 5% CARBON FILM	
7	2	R97,R99	101-0085	3.3K 1/4W 5% CARBON FILM	
8	2	R24,R62	101-0089	4.7K 1/4W 5% CARBON FILM	
9	4	R6,R19,R50,R61	101-0095	8.2K 1/4W 5% CARBON FILM	
10	21	R7,R8,R21,R29,R36, R57,R67R78,R83,R84, R85,R86,R88R93,R94, R96,R98,R108,R109, R112,R113	101-0097	10K 1/4W 5% CARBON FILM	
11	4	R39,R69,R73,R91	101-0100	13K 1/4W 5% CARBON FILM	
12	4	R25,R30,R37,R63	101-0101	15K 1/4W 5% CARBON FILM	
13	2	R76,R40	101-0104	20K 1/4W 5% CARBON FILM	
14	6	R5,R13,R18,R49,R58, R59	101-0105	22K 1/4W 5% CARBON FILM	
15	2	R48,R51	101-0107	27K 1/4W 5% CARBON FILM	
16	2	R68,R82	101-0108	30K 1/4W 5% CARBON FILM	
17	2	R70,R38	101-0109	33K 1/4W 5% CARBON FILM	
18	2	R77,R45	101-0114	51K 1/4W 5% CARBON FILM	
19	4	R1,R12,R32,R33	101-0118	75K 1/4W 5% CARBON FILM	
20	2	R71,R41	101-0119	82K 1/4W 5% CARBON FILM	
21	2	R28,R35	101-0121	100K 1/4W 5% CARBON FILM	
22	4	R2,R34,R44,R75	101-0123	120K 1/4W 5% CARBON FILM	
23	2	R20,R60	101-0125	150K 1/4W 5% CARBON FILM	
24	2	R74,R43	101-0129	220K 1/4W 5% CARBON FILM	
25	6	R27,R42,R65,R72, R87,R95	101-0133	330K 1/4W 5% CARBON FILM	
26	2	R23,R79	101-0148	2.0M 1/4W 5%CARBON FILM	
27	6	R9,R10,R11,R52,R53, R54	108-1003	10K POT 10 TURN R/A	
28	4	R114,R115,R116,R117	109-0097	10K 1/8W 5 %	
29	5	RP1,RP2,RP3,RP4,RP5	119-0008	10K x 7 BUSSED 8-PIN SIP	
30	12	C10,C11,C14,C15,C18, C22,C26,C30,C35,C36, C57,C59	150-0096	1000 PF 1KV +-10% CERAMIC DISC YSP	
31	2	C2,C16	151-0010	100PF 100V/200V +-10%/5% CERAMIC NPO	
32	21	C3,C12,C23,C28,C29, C31,C32,C33,C34,C38, C40,C41,C42,C43,C44, C45,C46,C47,C49,C50,C58	151-0120	.01UF 50V/100V +-10% CERAMIC X7R	
33	4	C1,C8,C17,C19	151-0181	.1UF 50V +-10% CERAMIC X7R	
34	4	C5,C37,C51,C53	152-0030	2.2 UF 250V +-10% POLYESTER	
35	5	C4,C9,C13,C21,C27	154-0025	1 UF 35V TANTALUM +- 10%	
36	11	C6,C7,C20,C24,C25, C39,C48,C52,C54,C55,C56	154-0100	10 UF 16V TANTALUM +-10%	
37	2	T4,T1	305-0018	PHONE HYBRID XFMR	
38	2	T2,T3	305-0104	10K:10K OHM AUDIO	
39	2	DS3,DS1	311-0009	LED GREEN	
40	2	DS2,DS4	311-0010	LED RED DIFFUSED TI-3/4	
41	4	U3,U6,U8,U11	316-0353	OP, AMP DUAL BIFET	353
42	2	U4,U7	316-0662	OP-AMP, CMOS, DUAL	C662
43	2	U10,U2	316-3403	QUAD BIPOLAR OP-AMP	3403

44	1	U19	323-4001	QUAD NOR GATE	4001
45	2	U12,U5	323-4051	1-TO-8 ANALOG MUX/DEMUX	4051
46	7	U1,U9,U13,U14,U18, U28,U31	323-4053	ANALOG SWITCH, TRIPLE SPDT	4053
47	4	U20,U21,U25,U26	323-4094	8 STAGE SERIAL REG	4094
48	4	U22,U23,U27,U30	323-4906	HEX LEVEL SHIFT	74C906
49	1	U24	324-4125	TRI-STATE QUAD BUFFER	74HC125
50	2	U29,U15	324-4165	SERIAL IN, PARALLEL OUT, 8-BIT SHIFT REGISTER	74HC165
51	1	U17	324-7414	HEX SCHMIDT	74HC14
52	2	Q1,Q3	340-0201	XSTR,JFET,N-CHANNEL,VGS > -1.5,TO-92	J201
53	1	U16	340-2003	RELAY DRIVER 50V/.5A	2003
54	2	Q2,Q4	340-3906	PNP 40V/200MA, TO92	2N3906
55	2	CR6,CR4	342-3009	DIODE, SILICON 100V 250MW	1N4148
56	2	CR7,CR8	343-3029	1W 5.1V +-5% MOTOROLA ONLY	1N4733A
57	2	CR3,CR5	343-3035	ZENER, 12V 1W +-5%	1N4742A
58	4	CR1,CR2,CR9,CR10	343-3108	ZENER, 15V 1W +-5%	1N4744A
59	1	SW1	371-0008	DIP SW, 8-POS, SIDE-ACTUATED	
60	2	K1,K2	380-0030	DPDT 12V COIL MINI RELAY 360 OHM	
61	4	JP1,JP2,JP3,JP7	403-0003	3 OF 401-0052	
62	2	JP4,JP6	403-0004	4 OF 401-0052	
63	1	P1	403-0005	5 OF 401-0052	
64	0	P3#,P2#	403-1026	26 OF 401-0036	
65	1	BRACKET	210-0001	NUT,KEP, 4-40, S-ZN	
66	1	BRACKET	220-0108	440 X 1/4 PAN PHILLIPS	
67	1	BRACKET	220-0199	632 X 1/4 PAN HD PHIL, BLACK	
68	1	**NOTE 2**	372-1002	KEYTOP RED, XMIT	
69	1	**NOTE 2**	372-1006	KEYTOP BLU, PATCH	
70	1	**NOTE 2**	372-1015	KEYTOP GRN, SELECT/RING	
71	1	**NOTE 2**	372-1054	KEYTOP YEL, V-ADJ/MUTE	
72	1	**NOTE 2**	372-1079	KEYTOP WHT, OnHK/OffHK	
73	1	**NOTE 2**	372-1089	KEYTOP WHT, HOOK-FLASH	
74	1	**NOTE 1**	401-0614	BRACKET, RA, #6-32 TAP	
75	6	XJP1-4,6,7 **(POS A)**	402-3040	MINI JUMPER	
76	6	XU3,4,6,7,8,11	407-0008	SKT, 08 PIN DIP	
77	9	XU2,10,17,19,22-24, 27,30	407-0014	SKT, 14 PIN DIP	
78	16	XU1,5,9,12-16,18, 20,21,25,26,28, 29,31	407-0016	SKT, 16 PIN DIP	
79	4	XP2,3 **(2 EA)**	407-0110	SKT, 10 PIN SIP	
80	2	XP2,3 **(1 EA)**	407-0112	SKT, 6 PIN SIP	
81	8	XJP5 **(PINS 1-2, 3-4, 5-6, 7-8)** XJP8 **(PINS 1-2, 3-4, 5-6, 7-8)**	408-0001	WIRE JUMPER	
82	1	PCB	410-9377F	M4010 DUAL CHANNEL BOARD	
83	4	XDS1-4	417-0010	LED MOUNT RA	
84	1		449-9018	BAG, PLASTIC 3x5 .004 GUAGE	

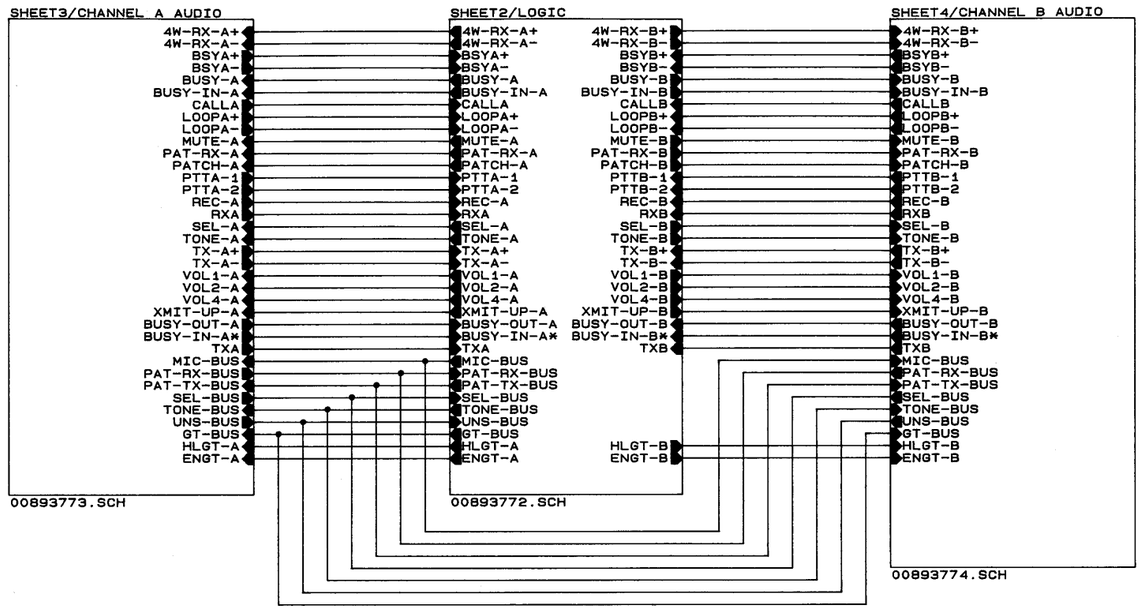
NOTES: (Notes are for production use only>)

Dual Channel Board Silkscreen



Dual Channel Board Schematic (008-9377L)

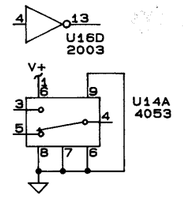
REV	DESCRIPTION	DRN	APR	DATE
A	RELEASE	KM		
B	HCN 1901	KM		
C	HCN 1918	KM		
D	HCN 2301	KN		
D.1	HCN 2527	DW		
E	HCN 2503A	DW		
F	HCN 2730	TC		
G	HCN 2736	DD		
H	ECN 2688C	ML	MM	3-23-95
J	ECN 3031	D.D.	MM	6-22-95
K	ECN 3046	BW	MM	7-31-95
L	ECN 5545	KM	MM	2-3-99



NOTES: UNLESS OTHERWISE SPECIFIED.

1. RESISTORS ARE IN OHMS, 1/4W, 5.
2. CAPACITORS ARE IN MICROFARADS.
3. POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

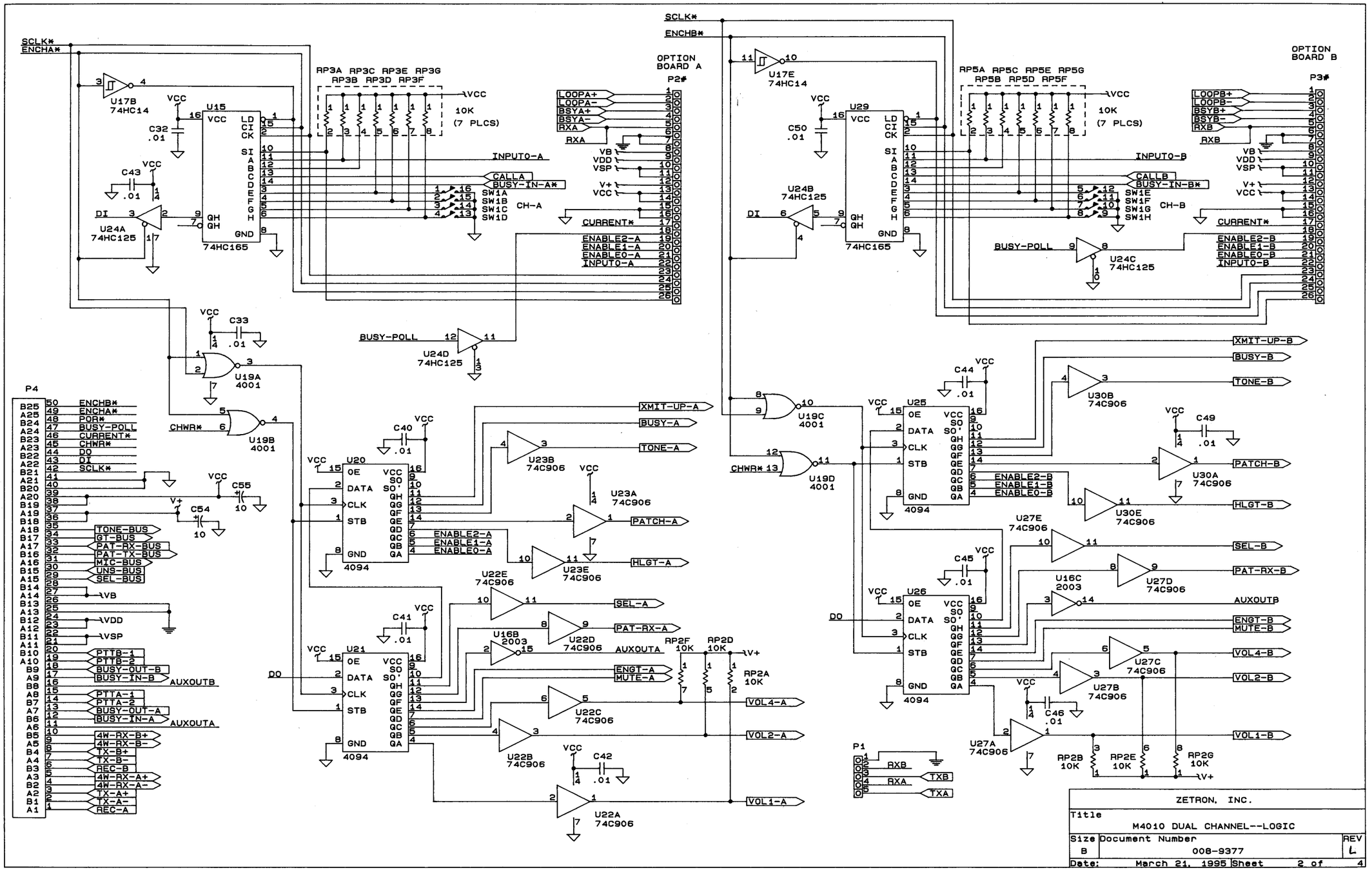
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
____X____	CUT TRACE.
--------	JUMPER WIRE.

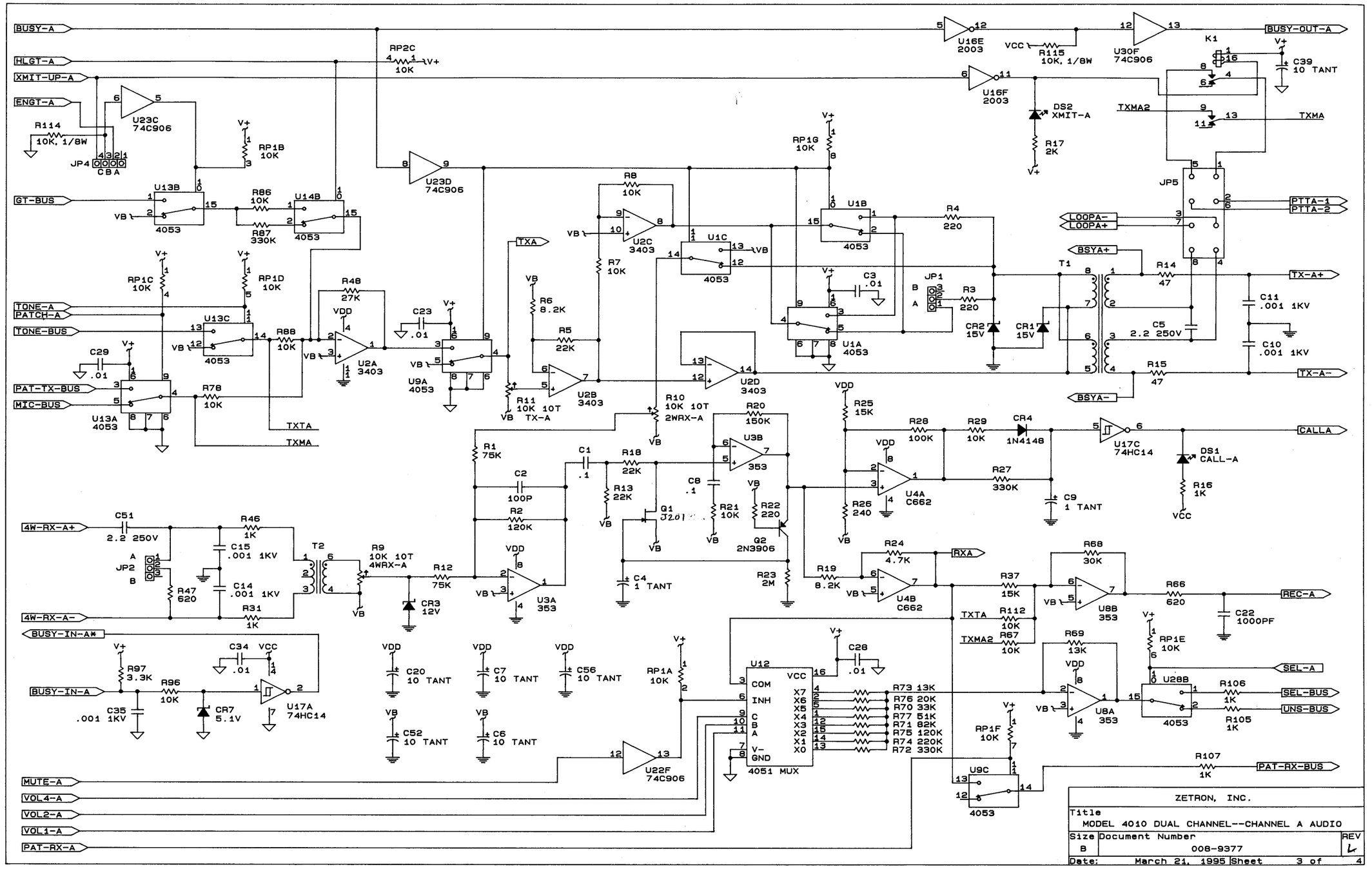
ZETRON, INC.
12335 134TH COURT N.E.
REDMOND, WASHINGTON 98052-2433

Title: MODEL 4010 DUAL CHANNEL

Size	Document Number	REV
B	008-9377	L

Date: March 21, 1995 Sheet 1 of 4


SCLK*
ENCHA*
ENCHB*
OPTION BOARD A
P2#
OPTION BOARD B
P3#
RP3A RP3C RP3E RP3G
RP3B RP3D RP3F
RP5A RP5C RP5E RP5G
RP5B RP5D RP5F
10K
(7 PLCS)
VCC
LOOPA+
LOOPA-
BSYA+
BSYA-
RXA
LOOPB+
LOOPB-
BSYB+
BSYB-
RXB
VB
VDD
VSP
V+
INPUT0-A
INPUT0-B
CALLA
CALLB
BUSY-IN-A*
BUSY-IN-B*
CH-A
CH-B
SW1A
SW1B
SW1C
SW1D
SW1E
SW1F
SW1G
SW1H
CURRENT*
ENABLE2-A
ENABLE1-A
ENABLE0-A
ENABLE2-B
ENABLE1-B
ENABLE0-B
U17B 74HC14
U17E 74HC14
U15
U29
74HC165
U24A 74HC125
U24B 74HC125
U24C 74HC125
U24D 74HC125
BUSY-POLL
C32 .01
C43 .01
C50 .01
C33 .01
C44 .01
C40 .01
C41 .01
C42 .01
C45 .01
C46 .01
C49 .01
C54 10
C55 10
U19A 4001
U19B 4001
U19C 4001
U19D 4001
CHWR*
DI
DO
U20
U21
U25
U26
4094
U23A 74C906
U23B 74C906
U23E 74C906
U22A 74C906
U22B 74C906
U22C 74C906
U22D 74C906
U22E 74C906
U27A 74C906
U27B 74C906
U27C 74C906
U27D 74C906
U27E 74C906
U30A 74C906
U30B 74C906
U30E 74C906
U16B 2003
U16C 2003
AUXOUTA
AUXOUTB
XMIT-UP-A
BUSY-A
TONE-A
PATCH-A
HLGT-A
SEL-A
PAT-RX-A
ENGT-A
MUTE-A
VOL4-A
VOL2-A
VOL1-A
XMIT-UP-B
BUSY-B
TONE-B
PATCH-B
HLGT-B
SEL-B
PAT-RX-B
AUXOUTB
ENGT-B
MUTE-B
VOL4-B
VOL2-B
VOL1-B
RP2A 10K
RP2B 10K
RP2D 10K
RP2E 10K
RP2F 10K
RP2G 10K
P4
TONE-BUS
GT-BUS
PAT-RX-BUS
PAT-TX-BUS
MIC-BUS
UNS-BUS
SEL-BUS
PTTB-1
PTTB-2
BUSY-OUT-B
BUSY-IN-B
PTTA-1
PTTA-2
BUSY-OUT-A
BUSY-IN-A
4W-RX-B+
4W-RX-B-
TX-B+
TX-B-
REC-B
4W-RX-A+
4W-RX-A-
TX-A+
TX-A-
REC-A
P1
RXB
RXA
TXB
TXA
ZETRON, INC.
Title
M4010 DUAL CHANNEL--LOGIC
Size B
Document Number 008-9377
REV L
Date: March 21, 1995
Sheet 2 of 4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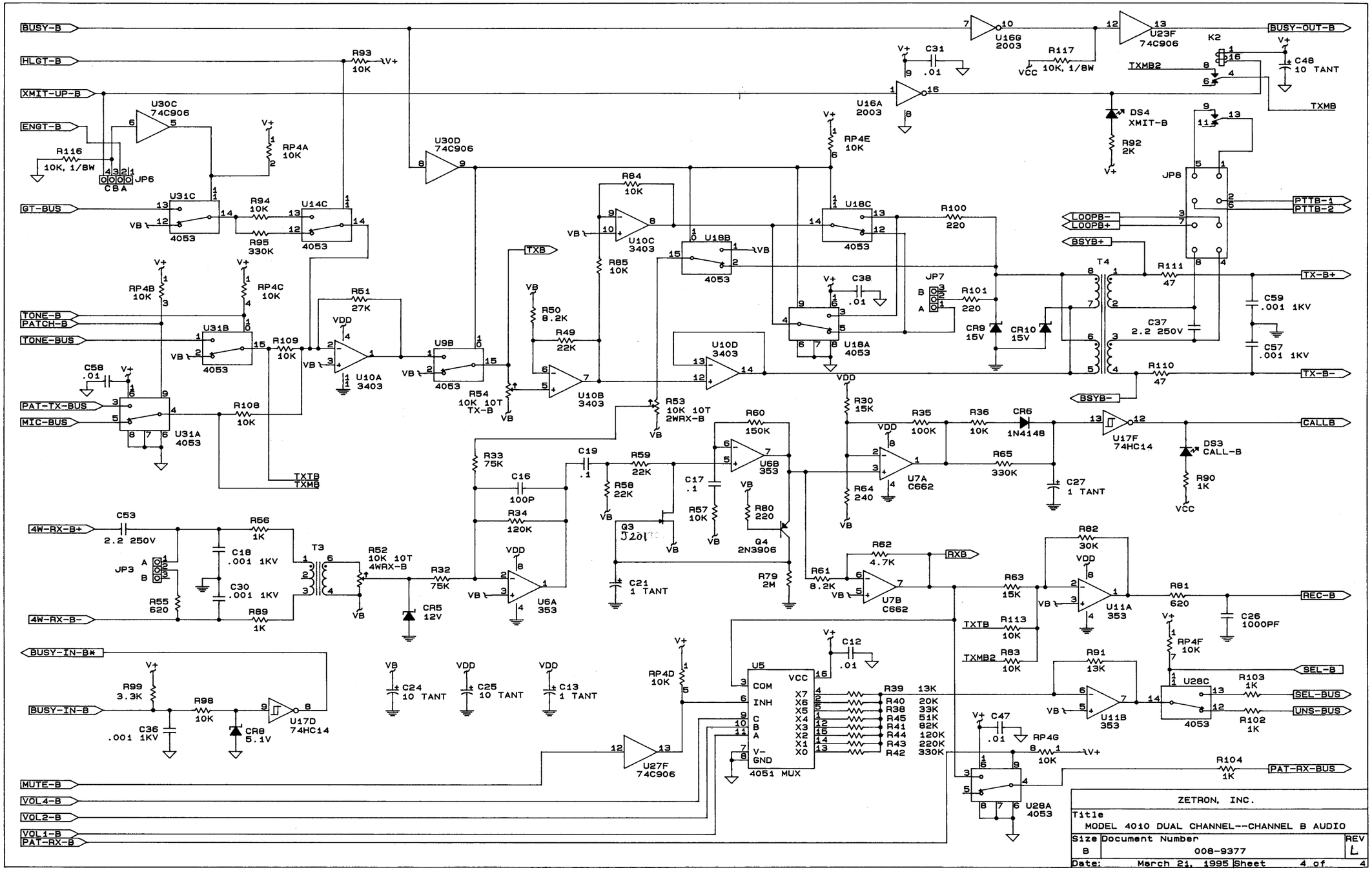
XMIT-UP-A
ENGT-A
GT-BUS
TONE-A
PATCH-A
TONE-BUS
PAT-TX-BUS
MIC-BUS
4W-RX-A+
4W-RX-A-
BUSY-IN-A*
BUSY-IN-A
MUTE-A
VOL4-A
VOL2-A
VOL1-A
PAT-RX-A
BUSY-OUT-A
CALLA
TXMA
TXMA2
TXA
TXTA
RXA
PTTA-1
PTTA-2
LOOPA-
LOOPA+
BSYA+
BSYA-
TX-A+
TX-A-
REC-A
SEL-A
SEL-BUS
UNS-BUS
PAT-RX-BUS
VCC
VDD
V+
VB
U23C 74C906
U23D 74C906
U16E 2003
U16F 2003
U30F 74C906
U13A 4053
U13B 4053
U13C 4053
U14B 4053
U1A 4053
U1B 4053
U1C 4053
U9A 4053
U2A 3403
U2B 3403
U2C 3403
U2D 3403
U3A 353
U3B 353
U4A C662
U4B C662
U8A 353
U8B 353
U17A 74HC14
U17C 74HC14
U22F 74C906
U28A 4053
U28B 4053
U9C 4053
U12 4051 MUX
T1
T2
K1
JP1
JP2
JP4
JP5
Q1 J201
Q2 2N3906
CR1 15V
CR2 15V
CR3 12V
CR4 1N4148
CR7 5.1V
DS1 CALL-A
DS2 XMIT-A
C39 10 TANT
R114 10K, 1/8W
R115 10K, 1/8W
RP1B 10K
RP1C 10K
RP1D 10K
RP1E 10K
RP1F 10K
RP1G 10K
RP2C 10K
R1 75K
R2 120K
R3 220
R4 220
R5 22K
R6 8.2K
R7 10K
R8 10K
R9 10K 10T 4WRX-A
R10 10K 10T 2WRX-A
R11 10K 10T TX-A
R12 75K
R13 22K
R14 47
R15 47
R16 1K
R17 2K
R18 22K
R19 8.2K
R20 150K
R21 10K
R22 220
R23 2M
R24 4.7K
R25 15K
R26 240
R27 330K
R28 100K
R29 10K
R31 1K
R37 15K
R46 1K
R47 620
R48 27K
R66 620
R67 330K
R68 30K
R69 13K
R70 33K
R71 82K
R72 330K
R73 13K
R74 220K
R75 120K
R76 20K
R77 51K
R78 10K
R86 10K
R87 330K
R88 10K
R96 10K
R97 3.3K
R105 1K
R106 1K
R107 1K
R112 10K
R167 10K
C1 .1
C2 100P
C3 .01
C4 1 TANT
C5 2.2 250V
C8 .1
C9 1 TANT
C10 .001 1KV
C11 .001 1KV
C14 .001 1KV
C15 .001 1KV
C20 10 TANT
C22 1000PF
C23 .01
C28 .01
C29 .01
C34 .01
C35 .001 1KV
C51 2.2 250V
C52 10 TANT
C56 10 TANT
C6 10 TANT
C7 10 TANT
ZETRON, INC.
Title
MODEL 4010 DUAL CHANNEL--CHANNEL A AUDIO
Size B
Document Number 008-9377
REV L
Date: March 21, 1995
Sheet 3 of 4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XMIT-UP-B
ENGT-B
GT-BUS
TONE-B
PATCH-B
TONE-BUS
PAT-TX-BUS
MIC-BUS
TXTB
TXMB
4W-RX-B+
4W-RX-B-
BUSY-IN-B*
BUSY-IN-B
MUTE-B
VOL4-B
VOL2-B
VOL1-B
PAT-RX-B
BUSY-OUT-B
TXMB2
TXB
RXB
PTTB-1
PTTB-2
LOOPB-
LOOPB+
BSYB+
BSYB-
TX-B+
TX-B-
CALLB
REC-B
SEL-B
SEL-BUS
UNS-BUS
PAT-RX-BUS
U30C 74C906
U30D 74C906
U16G 2003
U16A 2003
U23F 74C906
U31C 4053
U14C 4053
U31B 4053
U31A 4053
U9B 4053
U18C 4053
U18B 4053
U18A 4053
U10A 3403
U10B 3403
U10C 3403
U10D 3403
U6B 353
U6A 353
U7A C662
U7B C662
U11A 353
U11B 353
U17F 74HC14
U17D 74HC14
U27F 74C906
U5 4051 MUX
U28A 4053
U28C 4053
T3
T4
Q3 J201
Q4 2N3906
JP6 CBA
JP3
JP7
JP8
K2
DS4 XMIT-B
DS3 CALL-B
CR5 12V
CR6 1N4148
CR8 5.1V
CR9 15V
CR10 15V
R116 10K, 1/8W
R117 10K, 1/8W
R92 2K
R90 1K
R93 10K
RP4A 10K
RP4B 10K
RP4C 10K
RP4D 10K
RP4E 10K
RP4F 10K
RP4G 10K
R94 10K
R95 330K
R84 10K
R85 10K
R100 220
R101 220
R111 47
R110 47
R109 10K
R108 10K
R51 27K
R50 8.2K
R49 22K
R54 10K 10T TX-B
R53 10K 10T 2WRX-B
R60 150K
R59 22K
R58 22K
R57 10K
R80 220
R30 15K
R35 100K
R36 10K
R65 330K
R64 240
R62 4.7K
R61 8.2K
R63 15K
R82 30K
R81 620
R113 10K
R83 10K
R91 13K
R103 1K
R102 1K
R104 1K
R39 13K
R40 20K
R38 33K
R45 51K
R41 82K
R44 120K
R43 220K
R42 330K
R33 75K
R34 120K
R32 75K
R52 10K 10T 4WRX-B
R56 1K
R55 620
R89 1K
R99 3.3K
R98 10K
C31 .01
C38 .01
C58 .01
C53 2.2 250V
C18 .001 1KV
C30 .001 1KV
C36 .001 1KV
C16 100P
C19 .1
C17 .1
C21 1 TANT
C24 10 TANT
C25 10 TANT
C13 1 TANT
C12 .01
C47 .01
C48 10 TANT
C27 1 TANT
C59 .001 1KV
C57 .001 1KV
C37 2.2 250V
C26 1000PF
VCC
VDD
VB
V+
ZETRON, INC.
Title
MODEL 4010 DUAL CHANNEL--CHANNEL B AUDIO
Size B
Document Number 008-9377
REV L
Date: March 21, 1995 Sheet 4 of 4

DC REMOTE OPTION (950-9716)

DC Remote Daughter Board Part List (702-9380E)

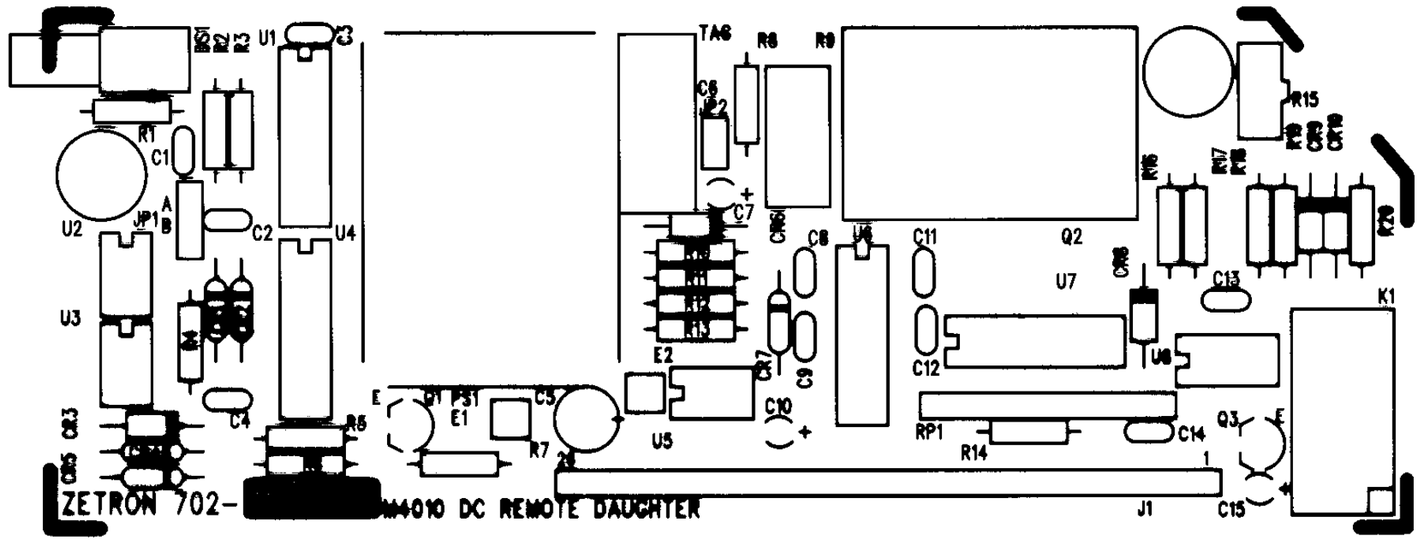
LEGEND:
+ = OPTION
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY

ZETRON M4010 DC REMOTE DAUGHTER BOARD PARTS LIST (702-9380E)

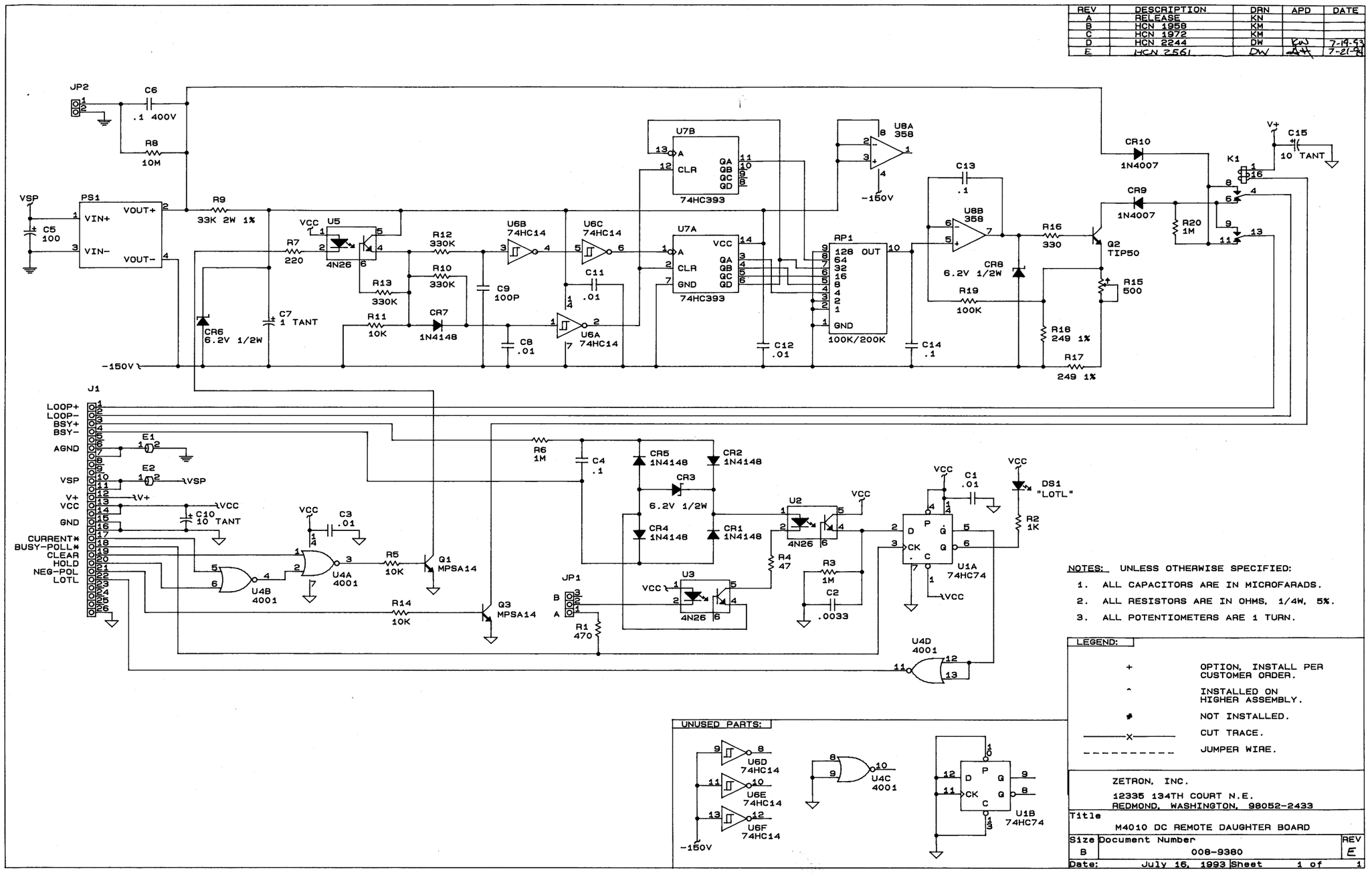
Item	Qty	Reference	Part	Description	Mfg.Part No.
1	1	R4	101-0047	47 OHM 1/4W 5% CARBON FILM	
2	1	R7	101-0057	220 OHM 1/4W 5% CARBON FILM	
3	1	R16	101-0061	330 OHM 1/4W 5% CARBON FILM	
4	1	R1	101-0065	470 OHM 1/4W 5% CARBON FILM	
5	1	R2	101-0073	1K 1/4W 5% CARBON FILM	
6	3	R5,R11,R14	101-0097	10K 1/4W 5% CARBON FILM	
7	1	R19	101-0121	100K 1/4W 5% CARBON FILM	
8	3	R10,R12,R13	101-0133	330K 1/4W 5% CARBON FILM	
9	3	R3,R6,R20	101-0145	1M 1/4W 5% CARBON FILM	
10	1	R8	101-0160	10M 1/4W 5% CARBON FILM	
11	1	R9	103-3312	33K 2W 5% CARBON FILM	
12	2	R18,R17	104-0047	249 OHM 1/4W 1%	
13	1	R15	107-0004	500 POT 1 TURN R/A	
14	1	RP1	119-0021	R/2R 100K/200K 10 PIN SIP	
15	1	C9	151-0010	100PF 100V/200V +-10%/5% CERAMIC NPO	
16	1	C2	151-0091	.0033UF 100V +-5% CERAMIC NPO	
17	5	C1,C3,C8,C11,C12	151-0120	.01UF 50V +-10% CERAMIC X7R	
18	2	C13,C14	151-0180	.1UF 50V +-20% CERAMIC Z5U	
19	1	C4	151-0181	.1UF 50V +-10% CERAMIC X7R	
20	1	C6	152-0011	.1 UF 400V +-10% POLYESTER	
21	1	C7	154-0025	1 UF 35V TANTALUM +- 10%	
22	2	C15,C10	154-0100	10 UF 16V TANTALUM +-10%	
23	1	C5	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
24	2	E1,E2	305-0001	FERRITE BEADS W/ LEADS	
25	3	U2,U3,U5	311-0008	OPTO ISOLATOR	4N26
26	1	DS1	311-0010	LED RED DIFFUSED TI-3/4	
27	1	U8	316-0358	OP-AMP, DUAL	358
28	1	U4	323-4001	QUAD NOR GATE	4001
29	1	U7	324-4393	DUAL 4 BIT COUNTER	74HC393
30	1	U6	324-7414	HEX SCHMIDT	74HC14
31	1	U1	324-7474	DUAL D FLIP FLOP	74HC74
32	2	Q1,Q3	340-0014	NPN DARLINGTON	MPSA14
33	1	Q2	340-0050	400V IA NPN	TIP50
34	5	CR1,CR2,CR4,CR5,CR7	342-3009	SILICON	1N4148
35	2	CR10,CR9	342-3011	SILICON 1A 1000V	1N4007
36	3	CR3,CR6,CR8	343-3017	1/2 6.2V 5%	1N5234B
37	1	K1	380-0030	DPDT 12V COIL MINI RELAY 360OHM	
38	1	JP2	403-0002	2 OF 401-0052	
39	1	JP1	403-0003	3 OF 401-0052	
40	1	J1	405-1026	26 OF 401-0065	
41	1	PS1	802-0090	DC-DC CONVERTER, 3W, 150V	
42	3	XQ2,STUDS (NOTE 2)	210-0001	440 KEPT NUT PLATED	
43	1	XQ2	220-0102	440 X 3/8 PAN PHILLIPS	
44	2	STUDS (NOTE 2)	220-0108	440X1/4 PAN PHILLIPS	
45	2	(NOTE 2)	250-0103	440x3/4 W/STUD	
46	1	XQ2	381-0010	HEATSINK TO-220 BLACK	
47	1	XJP1 (POS A)	402-3040	MINI JUMPER	
48	3	XU2,XU3,XU5	407-0006	SKT, 06 PIN DIP	
49	1	XU8	407-0008	SKT, 08 PIN DIP	
50	4	XU1,XU4,XU6,XU7	407-0014	SKT, 14 PIN DIP	
51	1	DS1	417-0010	LED MOUNT RA	
52	1	PCB	410-9380B	MODEL 4010 DC REMOTE DAUGHTER BOARD	

NOTES: (Notes are for production use only.)

DC Remote Daughter Board Silkscreen



DC Remote Daughter Board Schematic (008-9380E)



TONE REMOTE SYSTEM ADAPTER OPTION (950-9717, Early Production)

Tone Remote System Adapter Parts List (702-9433B)

LEGEND:

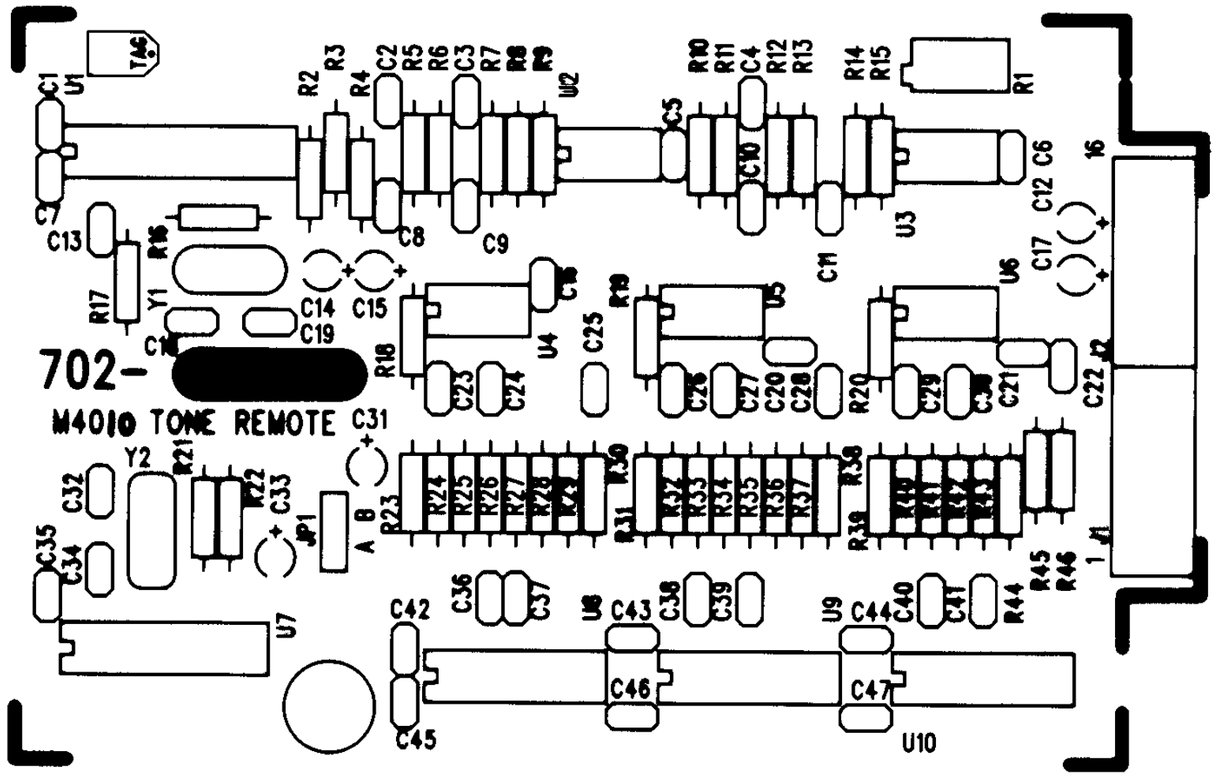
\# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
\+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON MODEL 4010 TONE REMOTE SYSTEM ADAPTER PART LIST (702-9433B)

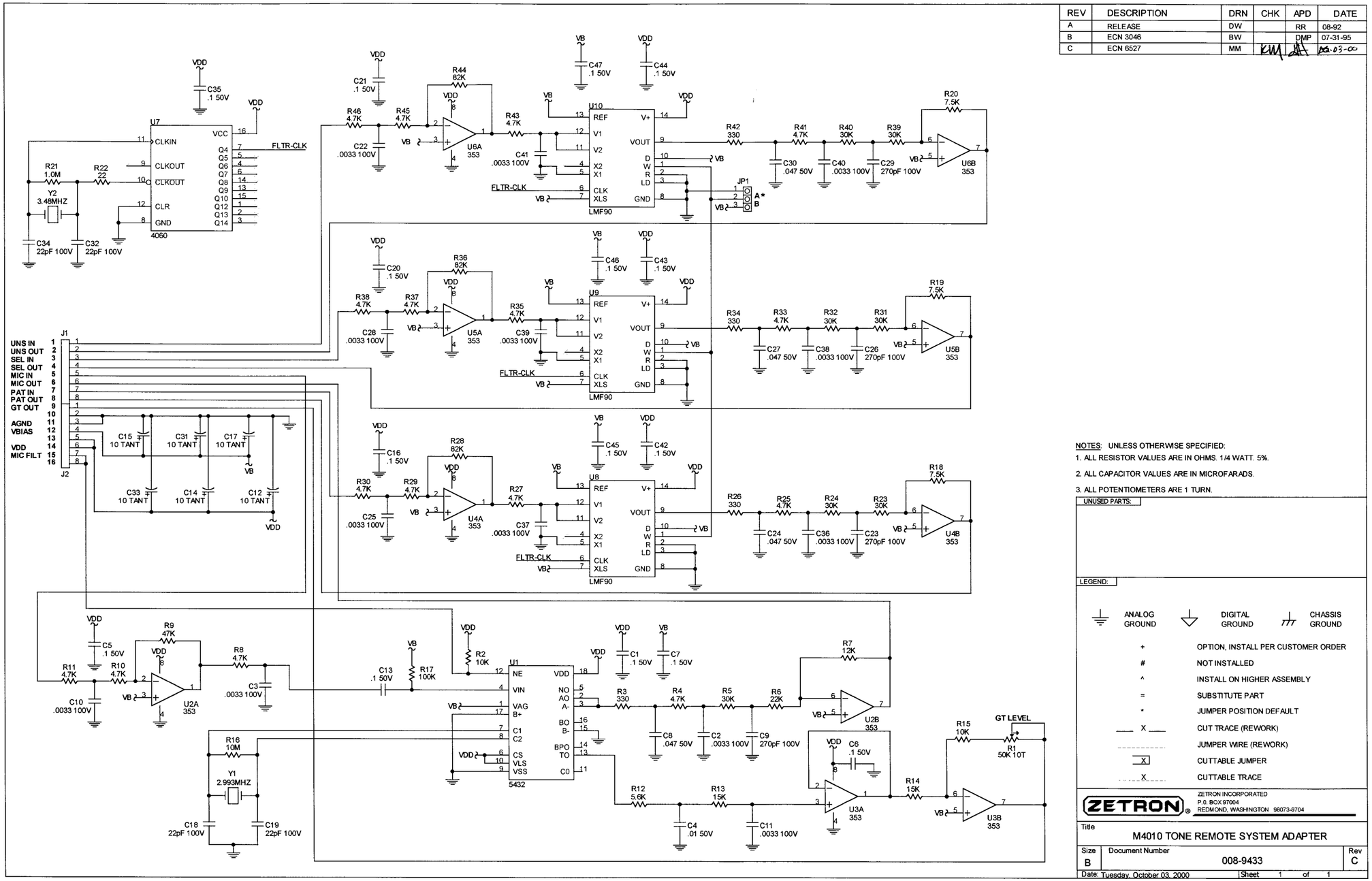
Item	Qty	Reference	Part	Description	Mfg.Part No.
1	1	R22	101-0033	22 OHM 1/4W 5% CARBON FILM	
2	4	R3,R26,R34,R42	101-0061	330 OHM 1/4W 5% CARBON FILM	
3	16	R4,R8,R10,R11,R25, R27,R29,R30,R33,R35, R37,R38,R41,R43,R45,R46	101-0089	4.7K 1/4W 5% CARBON FILM	
4	1	R12	101-0091	5.6K 1/4W 5% CARBON FILM	
5	3	R18,R19,R20	101-0094	7.5K 1/4W 5% CARBON FILM	
6	2	R2,R15	101-0097	10K 1/4W 5% CARBON FILM	
7	1	R7	101-0099	12K 1/4W 5% CARBON FILM	
8	2	R13,R14	101-0101	15K 1/4W 5% CARBON FILM	
9	1	R6	101-0105	22K 1/4W 5% CARBON FILM	
10	7	R5,R23,R24,R31,R32, R39,R40	101-0108	30K 1/4W 5% CARBON FILM	
11	1	R9	101-0113	47K 1/4W 5% CARBON FILM	
12	3	R28,R36,R44	101-0119	82K 1/4W 5% CARBON FILM	
13	1	R17	101-0121	100K 1/4W 5% CARBON FILM	
14	1	R21	101-0145	1M 1/4W 5% CARBON FILM	
15	1	R16	101-0160	10M 1/4W 5% CARBON FILM	
16	1	R1	108-1503	50K POT 10 TURN R/A	3296X-1-1503
17	4	C18,C19,C32,C34	151-0022	22PF 50V +-10%	CN15C220K
18	4	C9,C23,C26,C29	151-0027	270 PF 50V +-10% CERAMIC, TEMP. STABLE	CW15C271K
19	13	C2,C3,C10,C11,C22, C25,C28,C36,C37,C38, C39,C40,C41	151-0090	.0033 UF 50V +-10% CERAMIC, TEMP. STABLE	CW15C332K
20	1	C4	151-0120	.01 UF 50V +-10% CERAMIC, TEMP. STABLE	CW15C103K
21	4	C8,C24,C27,C30	151-0130	.047 UF 50V +-10% CERAMIC, TEMP. STABLE	CW20C473M
22	15	C1,C5,C6,C7,C13, C16,C20,C21,C35,C42, C43,C44,C45,C46,C47	151-0180	.1 UF 50V +-10% CERAMIC, UNSTABLE	AVXSR205E104MAA
23	6	C12,C14,C15,C17, C31,C33	154-0100	10 UF 16V TANTALUM	ECS-FICE106K
30	3	U8,U9,U10	316-0090	SWITCHED NOTCH FILTER	LMF90CCM
24	5	U2,U3,U4,U5,U6	316-0353	DUAL OP-AMP, DUAL BIFET	LF353
25	1	U1	316-5432	SF FILTER	MC145432P
29	1	U7	323-4060	14 BIT COUNTER	MC14060B
31	1	Y2	376-0348	3.48MHZ, HC-18 CASE	FOX3.48MHZ
26	1	Y1 **NOTE 2**	376-2993	CRYSTAL	CCL-6-2.993MHzP32
27	2	J1,J2	401-0168	CON SHELL 8 PIN R/A	22-15-2086
28	1	JP1	403-0003	3 OF 401-0052	
29	1	BRACKET	210-0001	440 KEPT NUT PLATED	
30	1	BRACKET	220-0108	440 X 1/4 PAN PHILLIPS	
30.5	1	BRACKET	220-0199	632x1/4 PAN HD PHIL, BLACK	
32	1	**NOTE 1**	401-0614	BRACKET, RA, #6-32 TAP	
33	1	XJP1 (POS A)	402-3040	MINI JUMPER	
34	5	XU2,XU3,XU4,XU5,XU6	407-0008	SKT, 08 PIN DIP	
35	3	XU8,XU9,XU10	407-0014	SKT, 14 PIN DIP	
36	1	XU7	407-0016	SKT, 16 PIN DIP	
37	1	XU1	407-0018	SKT, 18 PIN DIP	
38	1	PCB	410-9433A	PCB, M4010 TONE REMOTE SYSTEM ADAPTER	

NOTES: (Notes are for production use only.)

Tone Remote System Adapter Silkscreen



Tone Remote System Adapter Schematic (008-9433C)



TONE REMOTE SYSTEM ADAPTER OPTION (950-0255, Current Production)

Tone Remote Board Parts List (702-0037A)

LEGEND:

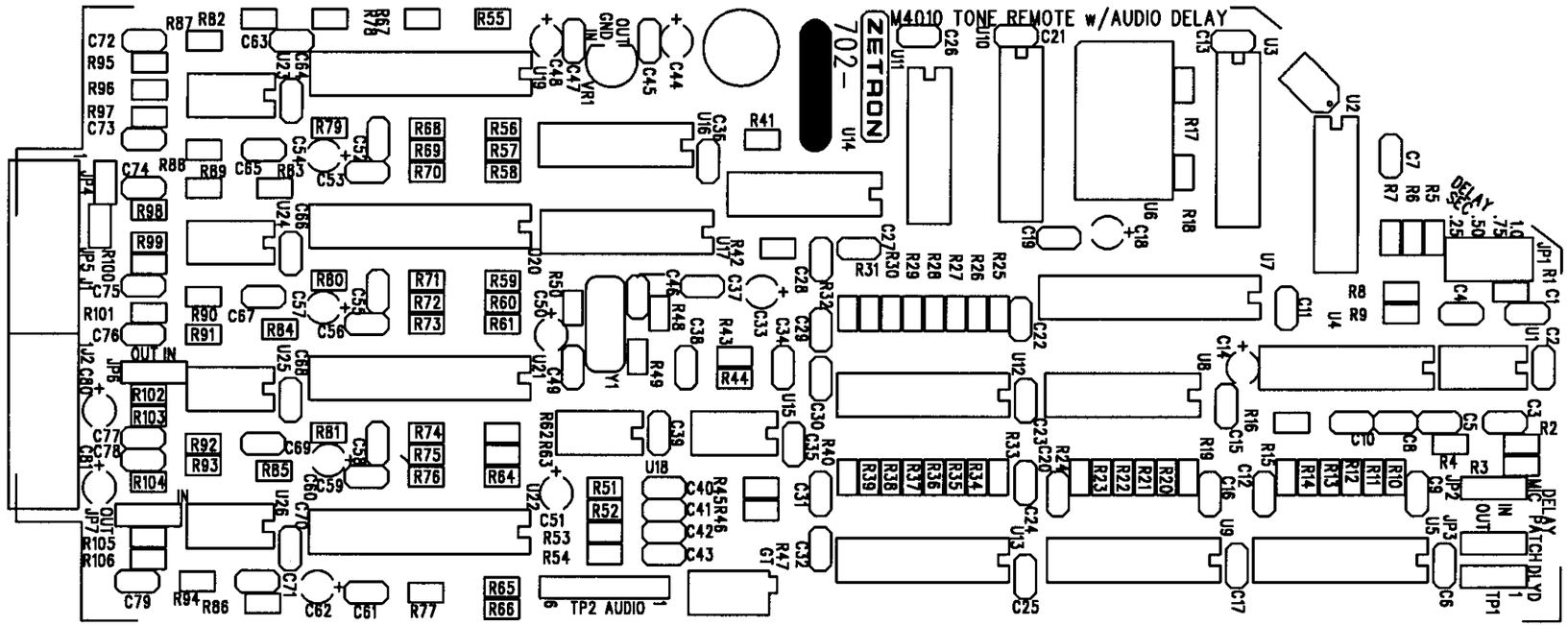
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON MODEL 4010 TONE REMOTE BOARD PARTS LIST:

Item	Qty	Reference	Part	Description	Mfg.Part No.
1	1	R47	108-1503	POT,50K OHM,10 TURN,R/A	50K 10T
2	1	R50	109-0020	RESISTOR,33 OHM,1/8W,5%,CARBON FILM	33 1/8W
3	0	R53#,R54#	109-0059	RESISTOR,270 OHM,1/8W,5%,CARBON FILM	270 1/8W
4	0	R13#,R22#,R25#,R29#, R33#,R37#	109-0073	RESISTOR,1.0K OHM,1/8W,5%,CARBON FILM	1.0K 1/8W
5	0	R12#,R21#,R28#,R36#	109-0080	RESISTOR,2.0K OHM,1/8W,5%,CARBON FILM	2.0K 1/8W
6	0	R14#,R23#,R30#,R38#	109-0085	RESISTOR,3.3K OHM,1/8W,5%,CARBON FILM	3.3K 1/8W
7	9	R51,R87,R89,R91,R93, R95,R98,R101,R104	109-0087	RESISTOR,4.3K OHM,1/8W,5%,CARBON FILM	4.3K 1/8W
8	20	R56,R59,R62,R65,R67, R68,R69,R70,R71,R72, R73,R74,R75,R76,R77, R78,R79,R80,R81,R86	109-0089	RESISTOR,4.7K OHM,1/8W,5%,CARBON FILM	4.7K 1/8W
9	1	R45	109-0094	RESISTOR,7.5K OHM,1/8W,5%,CARBON FILM	7.5K 1/8W
10	7	R1#,R2#,R4#,R5#,R6#, R7#,R9#,R16#,R17#, R18#,R44,R48,R52, R82,R83,R84,R85	109-0097	RESISTOR,10K OHM,1/8W,5 %,CARBON FILM	10K 1/8W
11	1	R43	109-0098	RESISTOR,12K OHM,1/8W,5%,CARBON FILM	12K 1/8W
12	0	R15#,R24#,R31#,R39#	109-0105	RESISTOR,22K OHM,1/8W,5%,CARBON FILM	22K 1/8W
13	9	R46,R88,R90,R92,R94, R97,R100,R103,R106	109-0108	RESISTOR,30K OHM,1/8W,5%,CARBON FILM	30K 1/8W
14	0	R32#,R40#	109-0113	RESISTOR,47K OHM,1/8W,5%,CARBON FILM	47K 1/8W
15	4	R96,R99,R102,R105	109-0116	RESISTOR,62K OHM,1/8W,5%,CARBON FILM	62K 1/8W
16	8	R55,R57,R58,R60,R61, R63,R64,R66	109-0118	RESISTOR,75K OHM,1/8W,5%,CARBON FILM	75K 1/8W
17	0	R3#,R8#,R11#,R20#, R26#,R34#,R42#	109-0121	RESISTOR,100K OHM,1/8W,5%,CARBON FILM	100K 1/8W
18	2	R49,R41	109-0145	RESISTOR,1.0M OHM,1/8W,5%,CARBON FILM	1.0M 1/8W
19	0	R10#,R19#,R27#,R35#	109-0160	RESISTOR,10M OHM,1/8W,5%,CARBON FILM	10M 1/8W
20	2	C49,C46	151-0022	CAP,22pF,100V,10%,CERAMIC,NPO	22pF 100V
21	4	C73,C75,C77,C79	151-0028	CAP,270pF,100V,5%,CERAMIC,NPO	270pF 100V
22	0	C5#,C4#	151-0080	CAP,.0022uF,100V,10%,CERAMIC,X7R	.0022 100V
23	5	C8#,C10#,C41,C42#, C43#,C52,C55,C58,C61	151-0085	CAP,.22uF,50V,20%,CERAMIC Z5U	.22 50V
24	9	C38,C65,C67,C69,C71, C72,C74,C76,C78	151-0090	CAP,.0033uF,100V,10%,CERAMIC,X7R	.0033 100V
25	0	C1#,C3#	151-0095	CAP,.0047uF,100V,10%,CERAMIC X7R	.0047 100V
26	2	C40,C34	151-0120	CAP,.01uF,50V,10%,CERAMIC,X7R	.01 50V
27	0	C9#,C12#,C16#,C20#, C22#,C24#,C30#,C32#	151-0130	CAP,.047uF,50V,10%,CERAMIC,X7R	.047
28	16	C2#,C6#,C7#,C11#, C13#,C15,C17#,C19#, C21#,C23#,C25#,C26#, C27,C28#,C29#,C31#, C35,C36,C37,C39,C45, C47,C53,C56,C59,C63, C64,C66,C68,C70	151-0180	CAP,.1uF,50V,20%,CERAMIC,Z5U	.1 50V
29	4	C54,C57,C60,C62	154-0035	CAP,2.2uF,25V,10%,TANTALUM	2.2 TANT
30	8	C14,C18#,C33,C44, C48,C50,C51,C80,C81	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT 16V
31	1	VR1	316-0005	REGULATOR,5V,LOW POWER,TO-92	78L05
32	4	U19,U20,U21,U22	316-0010	FILTER,UNIVERSAL,SWITCHED CAPACITOR,DUAL,DIP-20	MF10
33	6	U1#,U15,U18,U23,U24, U25,U26	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
34	0	U6#	321-1400	DRAM,1M x 4,80nS,16mS REFRESH,SOJ	1M x 4 DRAM
35	0	U7#	322-0025	PEEL,18CV8,DIP-20	18CV8 PEEL
36	0	U5#,U9#,U12#,U13#	323-3418	CVSD VOICE DIGITIZER,DIP-16	MC3418
37	0	U4#	324-4053	MUX/DEMUX,ANALOG,2 INPUT,TRIPLE,DIP-16	HC4053

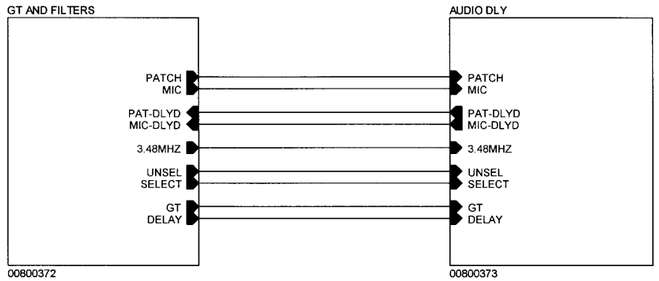
38	1	U17	324-4060	COUNTER,BINARY,RIPPLE,14-BIT,W/OSCILLATOR	74HC4060
39	0	U8#	324-4126	BUFFER,3-STATE,ACT. HI OUTPUT ENAB.,QUAD	74HC126
40	0	U10#,U3#	324-4157	MUX,2 INPUT,QUAD,DIP-16	74HC157
41	1	U2#,U11#,U16	324-4393	COUNTER,HC,4-BIT,DUAL	74HC393
42	1	U14	324-7408	AND,HC,2 INPUT,QUAD,DIP-14	74HC08
43	1	Y1	376-0348	XTAL,3.48MHZ,HC-18	3.48MHZ
44	2	J1,J2	401-0168	CONN,SHELL,8,PIN R/A	
45	0	JP5#,JP4#	403-0002	02 OF 401-0052	
46	2	TP1#,JP2#,JP3#,JP6, JP7	403-0003	03 OF 401-0052	
47	1	TP2	403-0006	06 OF 401-0052	
48	0	JP1#	403-0204	08 OF 401-0552 [4 x 2]	
49	2	XJP6,7 **(POS IN)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
50	2	XJP2,3 **(POS OUT)**	408-0001	WIRE JUMPER	
51	1	PCB	410-9896B	MODEL 4010 TONE REMOTE W/AUDIO DELAY	

Tone Remote Board w/Audio
Delay Silkscreen



Tone Remote Board Schematic (008-0037A)

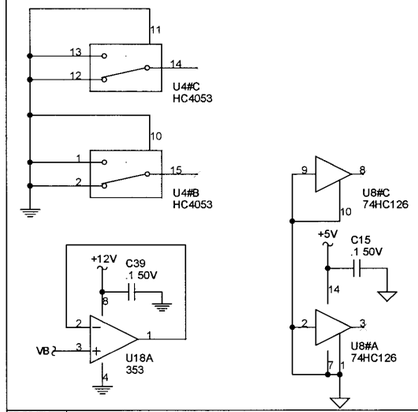
REV	DESCRIPTION	DRN	CHK	APD	DATE
A	RELEASE	BW	MM	DMP	06-26-00
B	ECN 6556	MM	MM	DMP	10-10-00



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS. 1/4 WATT. 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

ANALOG GROUND
DIGITAL GROUND
CHASSIS GROUND

+	OPTION, INSTALL PER CUSTOMER ORDER
#	NOT INSTALLED
^	INSTALL ON HIGHER ASSEMBLY
=	SUBSTITUTE PART
*	JUMPER POSITION DEFAULT
___ X ___	CUT TRACE (REWORK)
_ _ _ _	JUMPER WIRE (REWORK)
X	CUTTABLE JUMPER
_ _ X _ _	CUTTABLE TRACE

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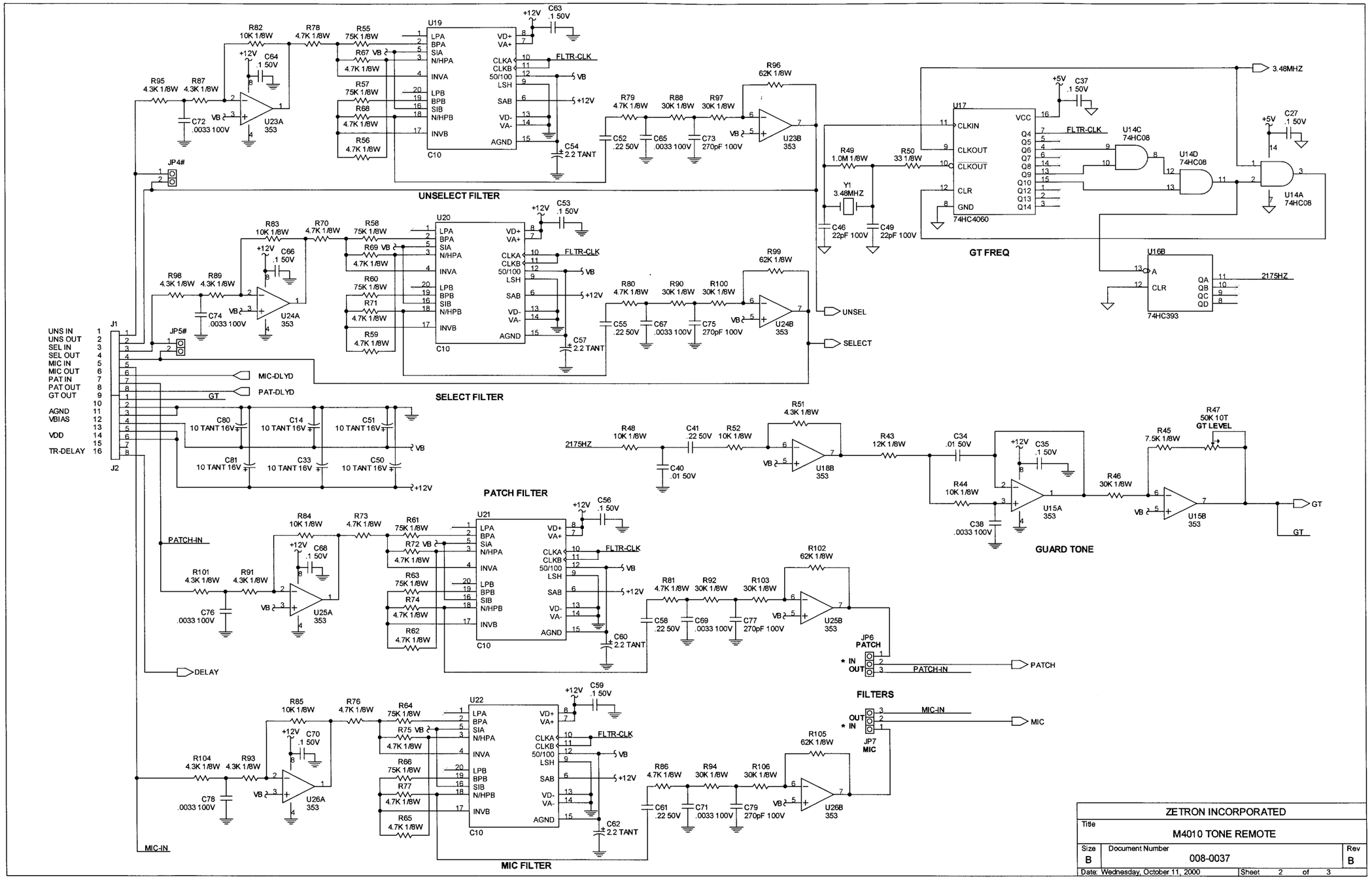
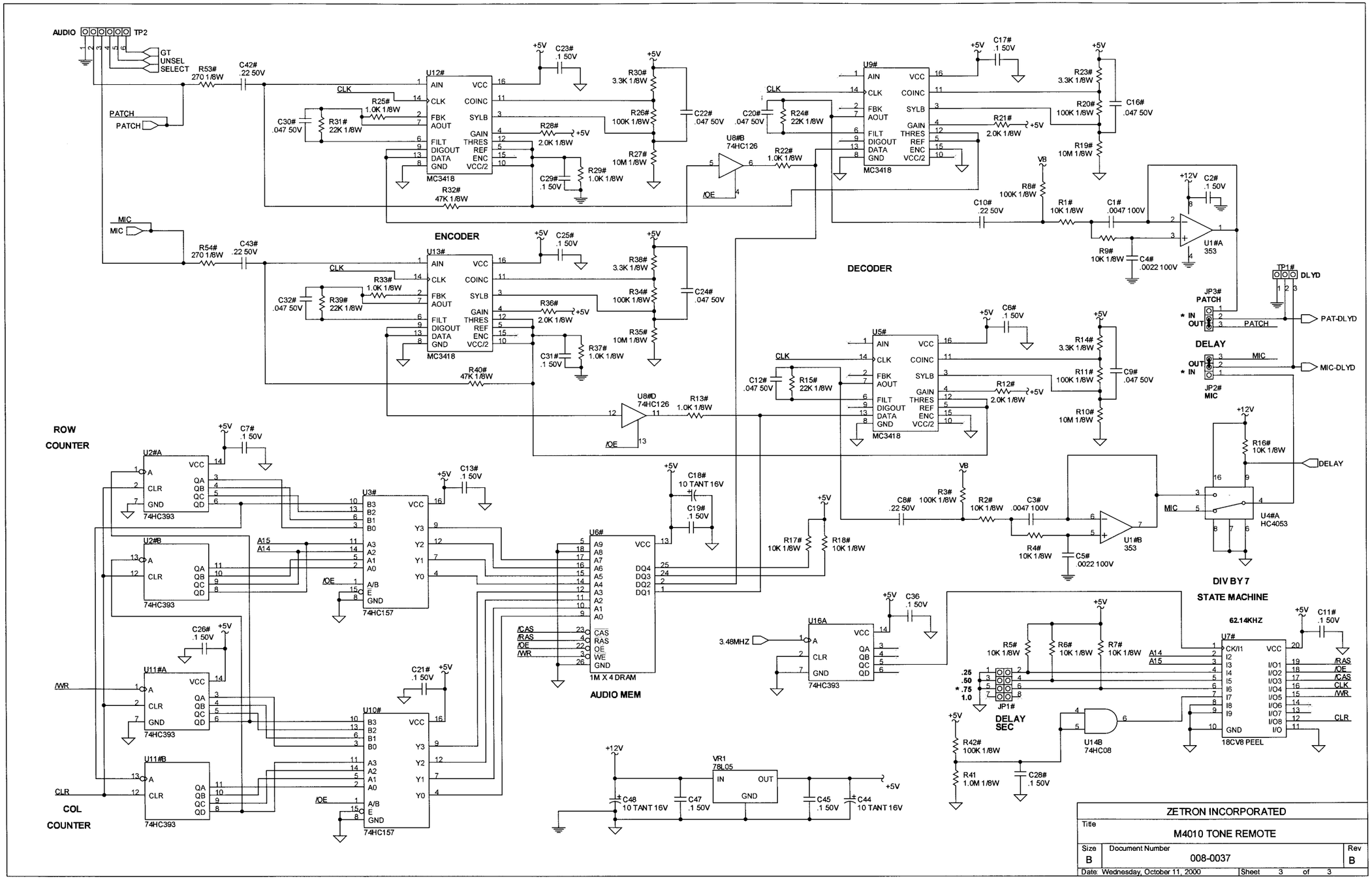
REDMOND, WASHINGTON 98073-9704

Title: M4010 TONE REMOTE

Size	Document Number	Rev
B	008-0037	B

Date: Wednesday, October 11, 2000 Sheet 1 of 3


UNSELECT FILTER
SELECT FILTER
PATCH FILTER
MIC FILTER
GT FREQ
GUARD TONE
FILTERS
U19
U20
U21
U22
U23A 353
U23B 353
U24A 353
U24B 353
U25A 353
U25B 353
U26A 353
U26B 353
U17
74HC4060
U14A 74HC08
U14C 74HC08
U14D 74HC08
U16B
74HC393
U18B 353
U15A 353
U15B 353
C10
J1
J2
JP4#
JP5#
JP6 PATCH
JP7 MIC
Y1 3.48MHZ
3.48MHZ
2175HZ
FLTR-CLK
MIC-DLYD
PAT-DLYD
GT
DELAY
PATCH-IN
MIC-IN
UNSEL
SELECT
PATCH
MIC
UNS IN
UNS OUT
SEL IN
SEL OUT
MIC IN
MIC OUT
PAT IN
PAT OUT
GT OUT
AGND
VBIAS
VDD
TR-DELAY
ZETRON INCORPORATED
M4010 TONE REMOTE
008-0037
Size B
Rev B
Date: Wednesday, October 11, 2000
Sheet 2 of 3


AUDIO
TP2
GT
UNSEL
SELECT
PATCH
MIC
ENCODER
DECODER
ROW
COUNTER
COL
COUNTER
DELAY
MIC
DLYD
PAT-DLYD
MIC-DLYD
DELAY
DIV BY 7
STATE MACHINE
62.14KHZ
AUDIO MEM
1M X 4 DRAM
DELAY
SEC
ZETRON INCORPORATED
M4010 TONE REMOTE
008-0037
Date: Wednesday, October 11, 2000
Sheet 3 of 3

Model 4010 Radio Dispatch Console Service Manual

TONE REMOTE WITH AUDIO DELAY OPTION (950-9922)

Tone Remote w/Audio Delay Parts List (702-9896C)

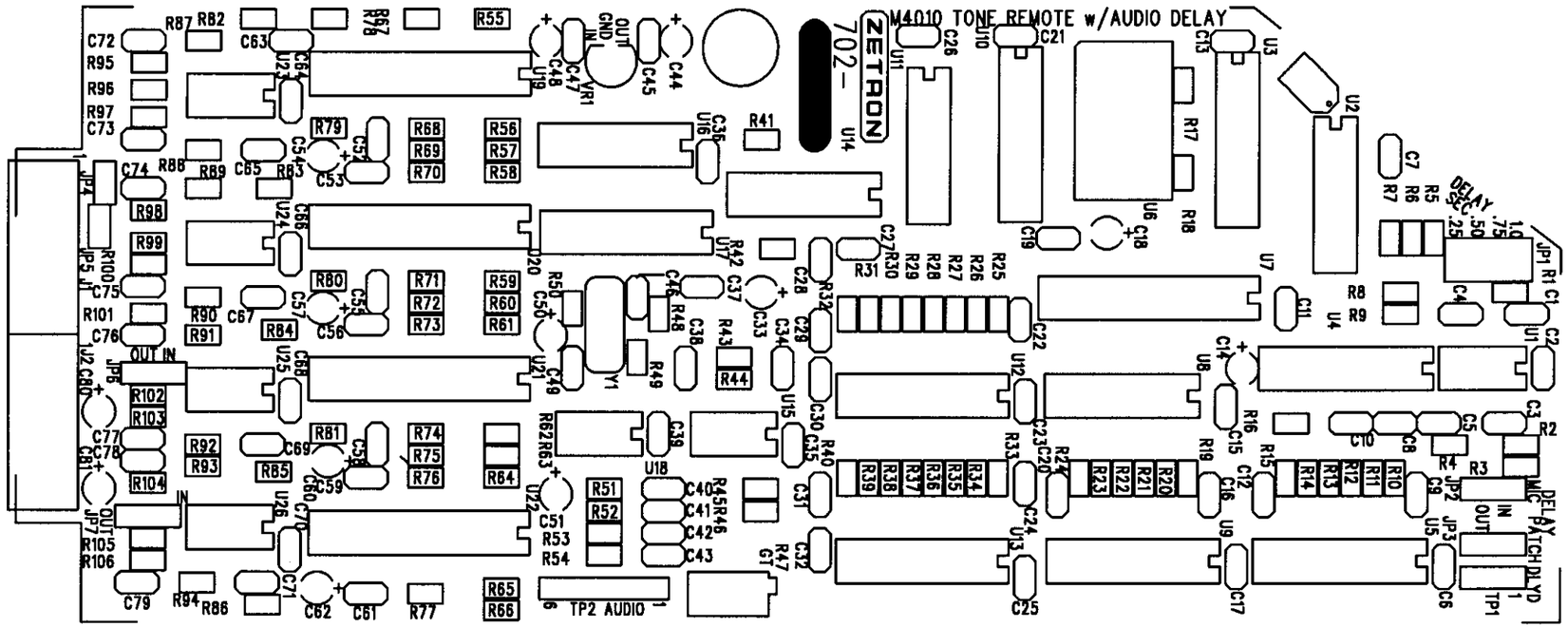
LEGEND:
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON MODEL 4010 TONE REMOTE W/AUDIO DELAY PARTS LIST: 702-9896

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R47	108-1503	POT,50K OHM,10 TURN,R/A	50K 10T
2	1	R50	109-0020	RESISTOR,33 OHM,1/8W,5%,CARBON FILM	33 1/8W
3	2	R54,R53	109-0059	RESISTOR,270 OHM,1/8W,5%,CARBON FILM	270 1/8W
4	6	R13,R22,R25,R29, R33,R37	109-0073	RESISTOR,1.0K OHM,1/8W,5%,CARBON FILM	1.0K 1/8W
5	4	R12,R21,R28,R36	109-0080	RESISTOR,2.0K OHM,1/8W,5%,CARBON FILM	2.0K 1/8W
6	4	R14,R23,R30,R38	109-0085	RESISTOR,3.3K OHM,1/8W,5%,CARBON FILM	3.3K 1/8W
7	9	R51,R87,R89,R91, R93,R95,R98,R101,R104	109-0087	RESISTOR,4.3K OHM,1/8W,5%,CARBON FILM	4.3K 1/8W
8	20	R56,R59,R62,R65, R67,R68,R69,R70,R71, R72,R73,R74,R75,R76, R77,R78,R79,R80,R81,R86	109-0089	RESISTOR,4.7K OHM,1/8W,5%,CARBON FILM	4.7K 1/8W
9	1	R45	109-0094	RESISTOR,7.5K OHM,1/8W,5%,CARBON FILM	7.5K 1/8W
10	17	R1,R2,R4,R5,R6,R7, R9,R16,R17,R18,R44, R48,R52,R82,R83,R84,R85	109-0097	RESISTOR,10K OHM,1/8W,5 %,CARBON FILM	10K 1/8W
11	1	R43	109-0098	RESISTOR,12K OHM,1/8W,5%,CARBON FILM	12K 1/8W
12	4	R15,R24,R31,R39	109-0105	RESISTOR,22K OHM,1/8W,5%,CARBON FILM	22K 1/8W
13	9	R46,R88,R90,R92, R94,R97,R100,R103,R106	109-0108	RESISTOR,30K OHM,1/8W,5%,CARBON FILM	30K 1/8W
14	2	R40,R32	109-0113	RESISTOR,47K OHM,1/8W,5%,CARBON FILM	47K 1/8W
15	4	R96,R99,R102,R105	109-0116	RESISTOR,62K OHM,1/8W,5%,CARBON FILM	62K 1/8W
16	8	R55,R57,R58,R60,R61, R63,R64,R66	109-0118	RESISTOR,75K OHM,1/8W,5%,CARBON FILM	75K 1/8W
17	7	R3,R8,R11,R20,R26, R34,R42	109-0121	RESISTOR,100K OHM,1/8W,5%,CARBON FILM	100K 1/8W
18	2	R49,R41	109-0145	RESISTOR,1.0M OHM,1/8W,5%,CARBON FILM	1.0M 1/8W
19	4	R10,R19,R27,R35	109-0160	RESISTOR,10M OHM,1/8W,5%,CARBON FILM	10M 1/8W
20	2	C46,C49	151-0022	CAP,22pF,100V,10%,CERAMIC NPO	22pF
21	4	C73,C75,C77,C79	151-0028	CAP,270pF,100V,5%,CERAMIC NPO	270pF
22	2	C4,C5	151-0080	CAP,.0022uF,100V,10%,CERAMIC X7R	.0022
23	9	C8,C10,C41,C42,C43, C52,C55,C58,C61	151-0085	CAP,.22uF,50V,20%,CERAMIC Z5U	.22
24	9	C38,C65,C67,C69,C71, C72,C74,C76,C78	151-0090	CAP,.0033uF,100V,10%,CERAMIC X7R	.0033
25	2	C1,C3	151-0095	CAP,.0047uF,100V,10%,CERAMIC X7R	.0047
26	2	C34,C40	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
27	8	C9,C12,C16,C20,C22, C24,C30,C32	151-0130	CAP,.047uF,50V,10%,CERAMIC X7R	.047
28	30	C2,C6,C7,C11,C13, C15,C17,C19,C21,C23, C25,C26,C27,C28,C29, C31,C35,C36,C37,C39, C45,C47,C53,C56,C59, C63,C64,C66,C68,C70	151-0180	CAP,.1uF,50V,20%,CERAMIC Z5U	.1
29	4	C54,C57,C60,C62	154-0035	CAP,2.2uF,25V,10%,TANTALUM	2.2 TANT
30	9	C14,C18,C33,C44,C48, C50,C51,C80,C81	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
31	1	VR1	316-0005	REGULATOR,5V,LOW POWER,TO-92	78L05
32	4	U19,U20,U21,U22	316-0010	FILTER,UNIVERSAL,SWITCHED CAPACITOR,DUAL,DIP-20	C10
33	7	U1,U15,U18,U23,U24, U25,U26	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
34	1	U6	321-1400	DRAM,1M x 4,80nS,16mS REFRESH,SOJ	1M x 4 DRAM
35	0	U7^	322-0025	PEEL,18CV8,DIP-20	18CV8 PEEL
36	4	U5,U9,U12,U13	323-3418	CVSD VOICE DIGITIZER,DIP-16	MC3418
37	1	U4	324-4053	MUX/DEMUX,ANALOG,2 INPUT,TRIPLE,DIP-16	HC4053
38	1	U17	324-4060	COUNTER,BINARY,RIPPLE,14-BIT,W/OSC.	74HC4060
39	1	U8	324-4126	BUFFER,3-STATE,ACTIVE HI OUTPUT ENAB.,QUAD	74HC126

40	2	U3,U10	324-4157	MUX,2 INPUT,QUAD,DIP-16	74HC157
41	3	U2,U11,U16	324-4393	COUNTER,HC,4-BIT,DUAL	74HC393
42	1	U14	324-7408	AND,HC,2 INPUT,QUAD,DIP-14	74HC08
43	1	Y1	376-0348	XTAL,3.48MHZ,HC-18	3.48MHZ
44	2	J2,J1	401-0400	CONN,8 POS, 0.1" FEMALE, PC-RA, GOLD	
45	0	JP4#,JP5#	403-0002	02 OF 401-0052	
46	5	TP1,JP2,JP3,JP6,JP7	403-0003	03 OF 401-0052	
47	1	TP2	403-0006	06 OF 401-0052	
48	1	JP1	403-0204	08 OF 401-0552 [4 x 2]	
49	5	XJP2,3,6,7 **(POS IN)** XJP1 **(POS .75)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
50	1	XU7	407-0020	SKT, 20 PIN DIP	
51	1	PCB	410-9896B	MODEL 4010 TONE REMOTE W/AUDIO DELAY	

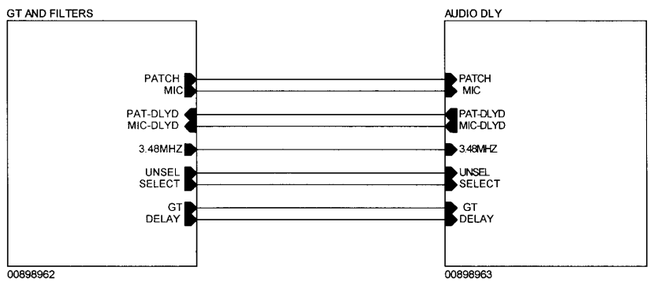
Tone Remote w/Audio Delay Silkscreen



Model 4010 Radio Dispatch Console Service Manual

Tone Remote w/Audio Delay Schematic (008-9896C)

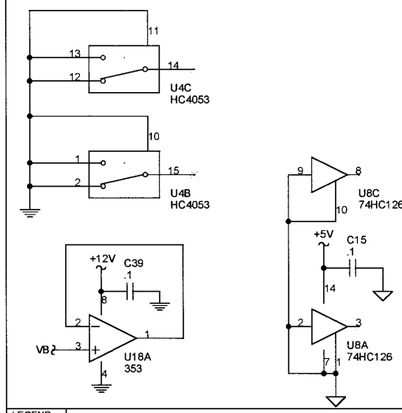
REV	DESCRIPTION	DRN	CHK	APD	DATE
A	RELEASE	MM	GH	DMP	08-13-97
B	ECN 5793	MM	KM	DMP	07-13-99
C	ECN 6527	MM	MM		



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

ANALOG GROUND | DIGITAL GROUND | CHASSIS GROUND

+	OPTION, INSTALL PER CUSTOMER ORDER
#	NOT INSTALLED
^	INSTALL ON HIGHER ASSEMBLY
=	SUBSTITUTE PART
*	JUMPER POSITION DEFAULT
___ X ___	CUT TRACE (REWORK)
- - - - - - - - -	JUMPER WIRE (REWORK)
X	CUTTABLE JUMPER
X	CUTTABLE TRACE

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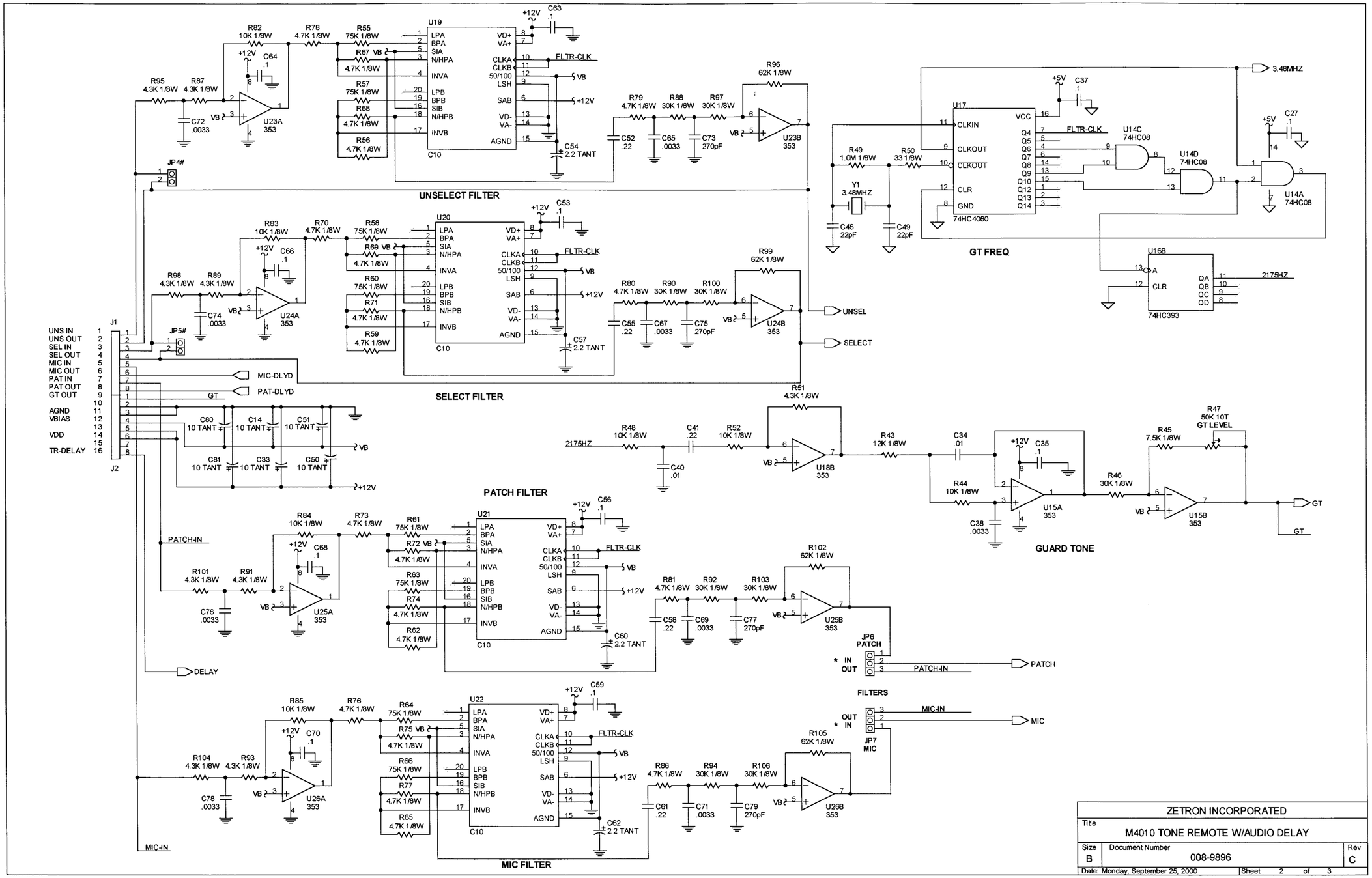
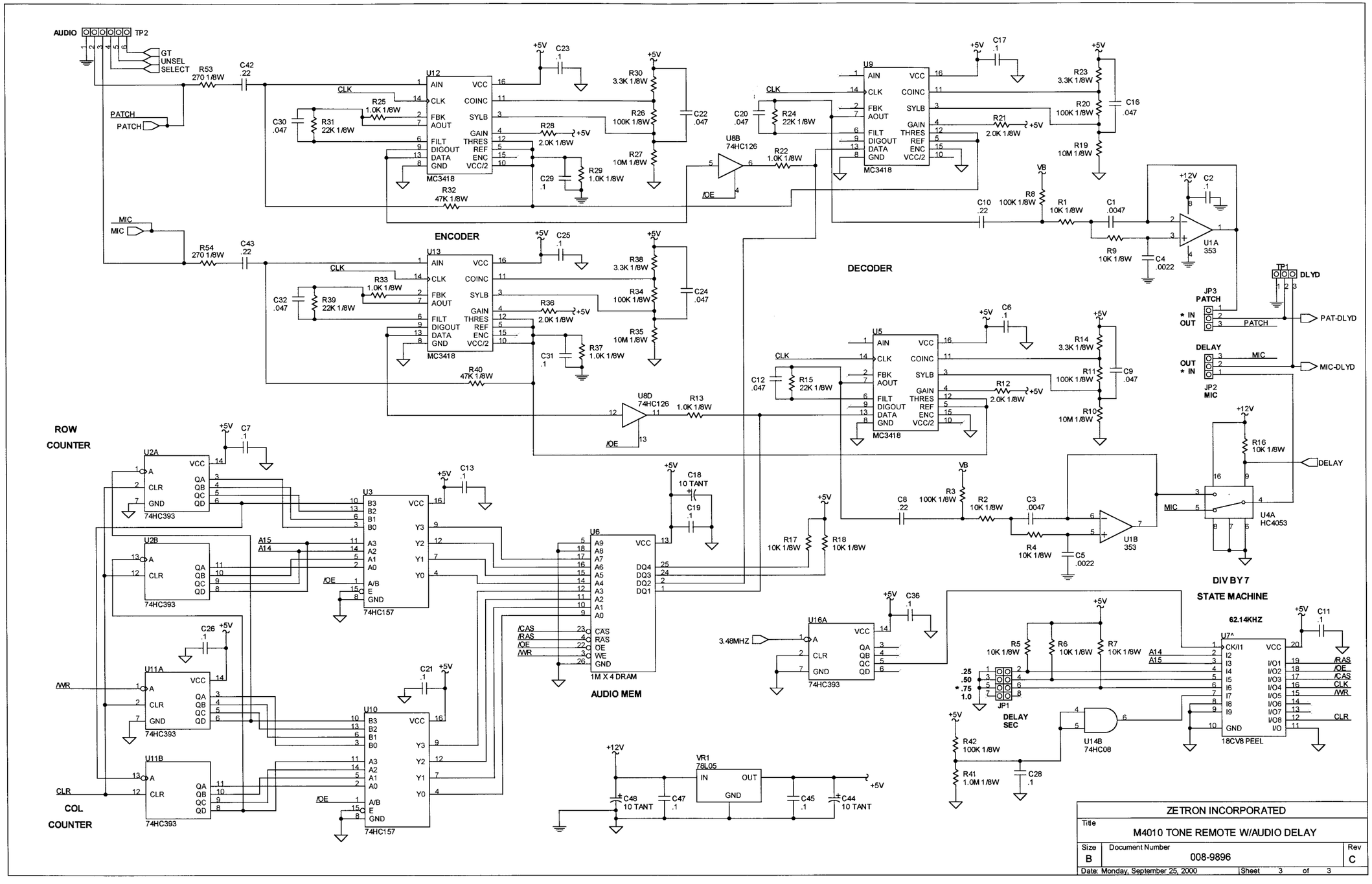
REDMOND, WASHINGTON 98073-9704

Title: M4010 TONE REMOTE W/AUDIO DELAY

Size	Document Number	Rev
B	008-9896	C

Date: Tuesday, September 26, 2000 | Sheet 1 of 3


UNSELECT FILTER
SELECT FILTER
PATCH FILTER
MIC FILTER
GT FREQ
GUARD TONE
FILTERS
U19
U20
U21
U22
U17
C10
74HC4060
74HC393
74HC08
353
FLTR-CLK
VB
+12V
+5V
3.48MHZ
2175HZ
UNSEL
SELECT
PATCH
PATCH-IN
MIC-IN
MIC
DELAY
GT
MIC-DLYD
PAT-DLYD
UNS IN
UNS OUT
SEL IN
SEL OUT
MIC IN
MIC OUT
PAT IN
PAT OUT
GT OUT
AGND
VBIAS
VDD
TR-DELAY
GT LEVEL
ZETRON INCORPORATED
M4010 TONE REMOTE W/AUDIO DELAY
Size B
Document Number 008-9896
Rev C
Date: Monday, September 25, 2000
Sheet 2 of 3


AUDIO
TP2
GT
UNSEL
SELECT
PATCH
MIC
ENCODER
DECODER
ROW
COUNTER
COL
COUNTER
AUDIO MEM
DIV BY 7
STATE MACHINE
DELAY
SEC
62.14KHZ
3.48MHZ
DLYD
PAT-DLYD
MIC-DLYD
DELAY
MC3418
74HC393
74HC157
74HC126
1M X 4 DRAM
18CV8 PEEL
74HC08
74HC4053
78L05
ZETRON INCORPORATED
M4010 TONE REMOTE W/AUDIO DELAY
008-9896
Monday, September 25, 2000

TONE REMOTE LOTL OPTION (950-9718)

Tone Remote LOTL Board Part List (702-9450D.1)

LEGEND:

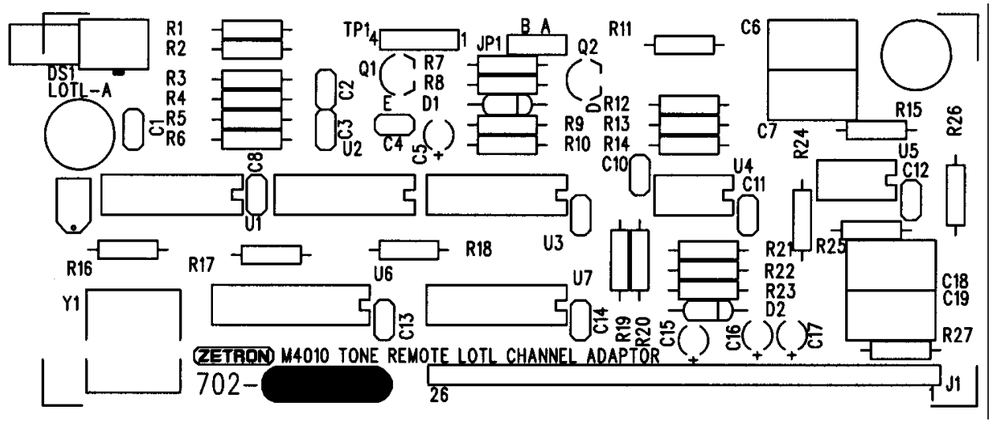
+	=	OPTION, INSTALL PER CUSTOMER ORDER
#	=	NOT INSTALLED
^	=	INSTALLED ON HIGHER ASSY
=	=	SUBSTITUTE PART

ZETRON MODEL 4010 TONE REMOTE LOTL DAUGHTER BOARD PARTS LIST:

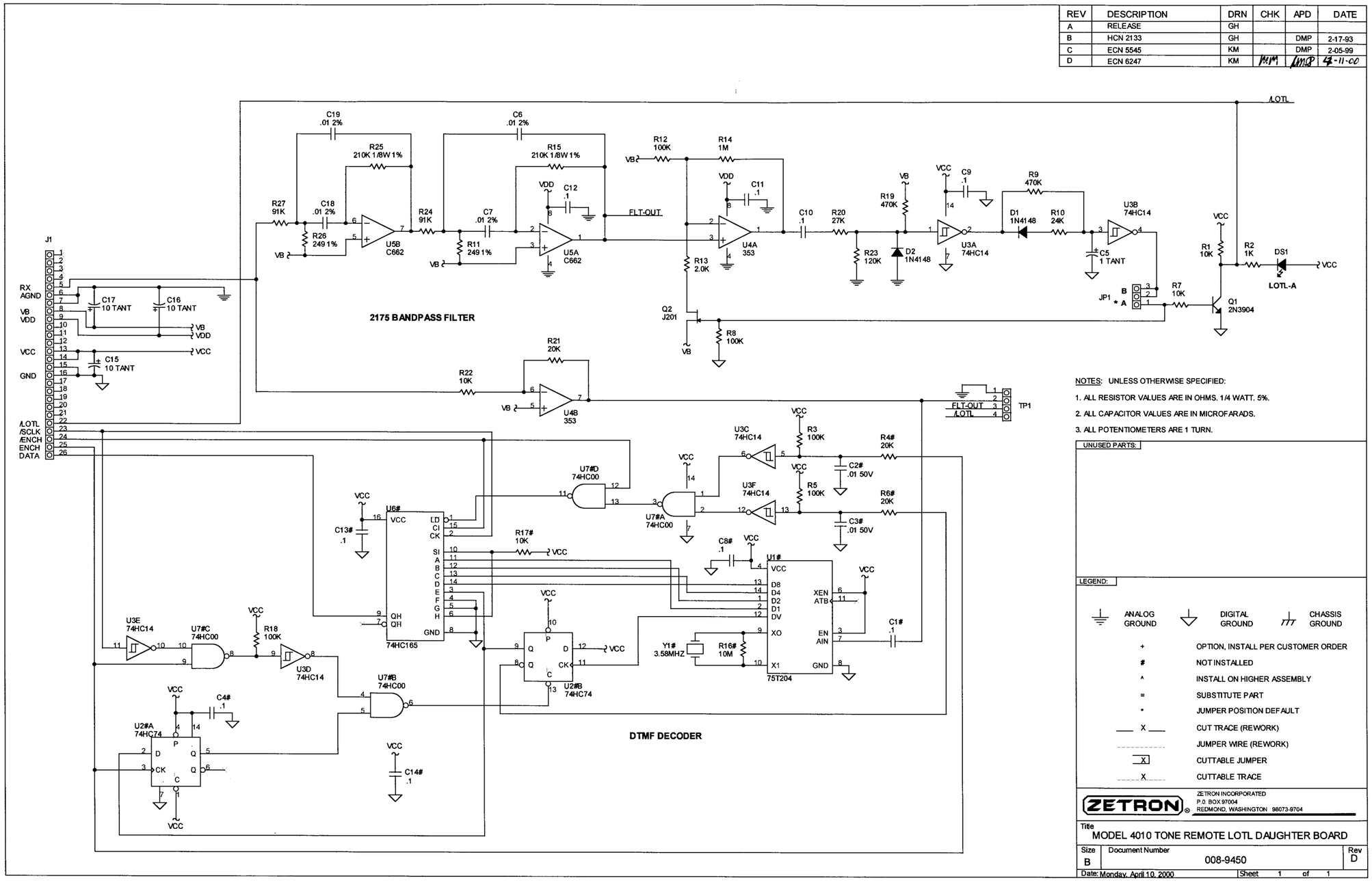
Item	Qty	Reference	Part No.	Description	Part Value
1	1	R2	101-0073	RESISTOR,1.0K OHM,1/4W,5%,CARBON FILM	1.0K
2	1	R13	101-0080	RESISTOR,2.0K OHM,1/4W,5%,CARBON FILM	2.0K
3	3	R1,R7,R17#,R22	101-0097	RESISTOR,10K OHM,1/4W,5%,CARBON FILM	10K
4	1	R4#,R6#,R21	101-0104	RESISTOR,20K OHM,1/4W,5%,CARBON FILM	20K
5	1	R10	101-0106	RESISTOR,24K OHM,1/4W,5%,CARBON FILM	24K
6	1	R20	101-0107	RESISTOR,27K OHM,1/4W,5%,CARBON FILM	27K
7	2	R24,R27	101-0120	RESISTOR,91K OHM,1/4W,5%,CARBON FILM	91K
8	5	R3,R5,R8,R12,R18	101-0121	RESISTOR,100K OHM,1/4W,5%,CARBON FILM	100K
9	1	R23	101-0123	RESISTOR,120K OHM,1/4W,5%,CARBON FILM	120K
10	2	R9,R19	101-0137	RESISTOR,470K OHM,1/4W,5%,CARBON FILM	470K
11	1	R14	101-0145	RESISTOR,1.0M OHM,1/4W,5%,CARBON FILM	1.0M
12	0	R16#	101-0160	RESISTOR,10M OHM,1/4W,5%,CARBON FILM	10M
13	2	R11,R26	104-0047	RESISTOR,249 OHM,1/4W,1%,100PPM/C,METAL FILM	249 1%
14	2	R15,R25 **NOTE 4**	110-2103	RESISTOR,210K 0HM,1/8W,1%,100PPM/C,METAL FLM	210K 1/8W 1
15	0	C2#,C3#	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
16	4	C1#,C4#,C8#,C9,C10, C11,C12,C13#,C14# **NOTE 5**	151-0180	CAP,.1uF,50V,20%,CERAMIC Z5U	.1
17	4	C6,C7,C18,C19	152-0100	CAP,.01uF,100V,2%,POLYPROPYLENE,AXIAL	.01 2%
18	1	C5	154-0025	CAP,1uF,35V,10%,TANTALUM	1 TANT
19	3	C15,C16,C17	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
20	1	DS1	311-0010	LED,RED,DIFFUSED,T1-3/4	
21	1	U4	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
22	1	U5	316-0662	OP-AMP,CMOS,DUAL,DIP-8	C662
23	0	U1#	321-0204	RCVR,DTMF,DIP-14	75T204
24	0	U6#	324-4165	SIP-INPUT,SERIAL OUTPUT 8-BIT SR,HC	74HC165
25	0	U7#	324-7400	NAND,HC,2 INPUT,QUAD,DIP-14	74HC00
26	1	U3	324-7414	INVERTER,SCHMITT,MOTOROLA THRESHOLDS,HEX,DIP-14	74HC14
27	0	U2#	324-7474	FLIP-FLOP,D,HC,DUAL,DIP-14	74HC74
28	1	Q2	340-0201	XSTR,JFET,N-CHANNEL,VGS > -1.5,TO-92	J201
29	1	Q1	340-3904	XSTR,NPN,40V/200MA,TO92	2N3904
30	2	D1,D2	342-3009	DIODE,SILICON,100V,250MW	1N4148
31	0	Y1#	376-0358	XTAL,3.579545MHZ,CL=18pF,HC-49	3.58MHZ
32	1	JP1	403-0003	03 OF 401-0052	
33	1	TP1	403-0004	04 OF 401-0052	
34	1	J1 **NOTE 1**	403-1026	26 OF 401-0036	
35	2	**NOTE 2**	210-0001	NUT,KEP, 4-40, S-ZN	
36	2	**NOTE 2**	220-0108	440 X 1/4 PAN PHILLIPS SCREW	
37	2	**NOTE 2**	250-0103	3/4" STUD STANDOFF	
38	1	XJP1 **(POS A)**	402-3040	MINI JUMPER	
39	1	PCB **NOTE 3**	410-9450C	M4010 TONE REMOTE LOTL DAUGHTER BOARD	
40	1	XDS1	417-0010	LED MOUNT RA	

NOTES: (Notes are for production use only.)

Tone Remote LOTL Board Silkscreen



Tone Remote LOTL Board Schematic (008-9450D)



SINGLE PHONE PATCH OPTION (950-9719)

Single Phone Patch Card Parts List (702-9403H)

LEGEND:

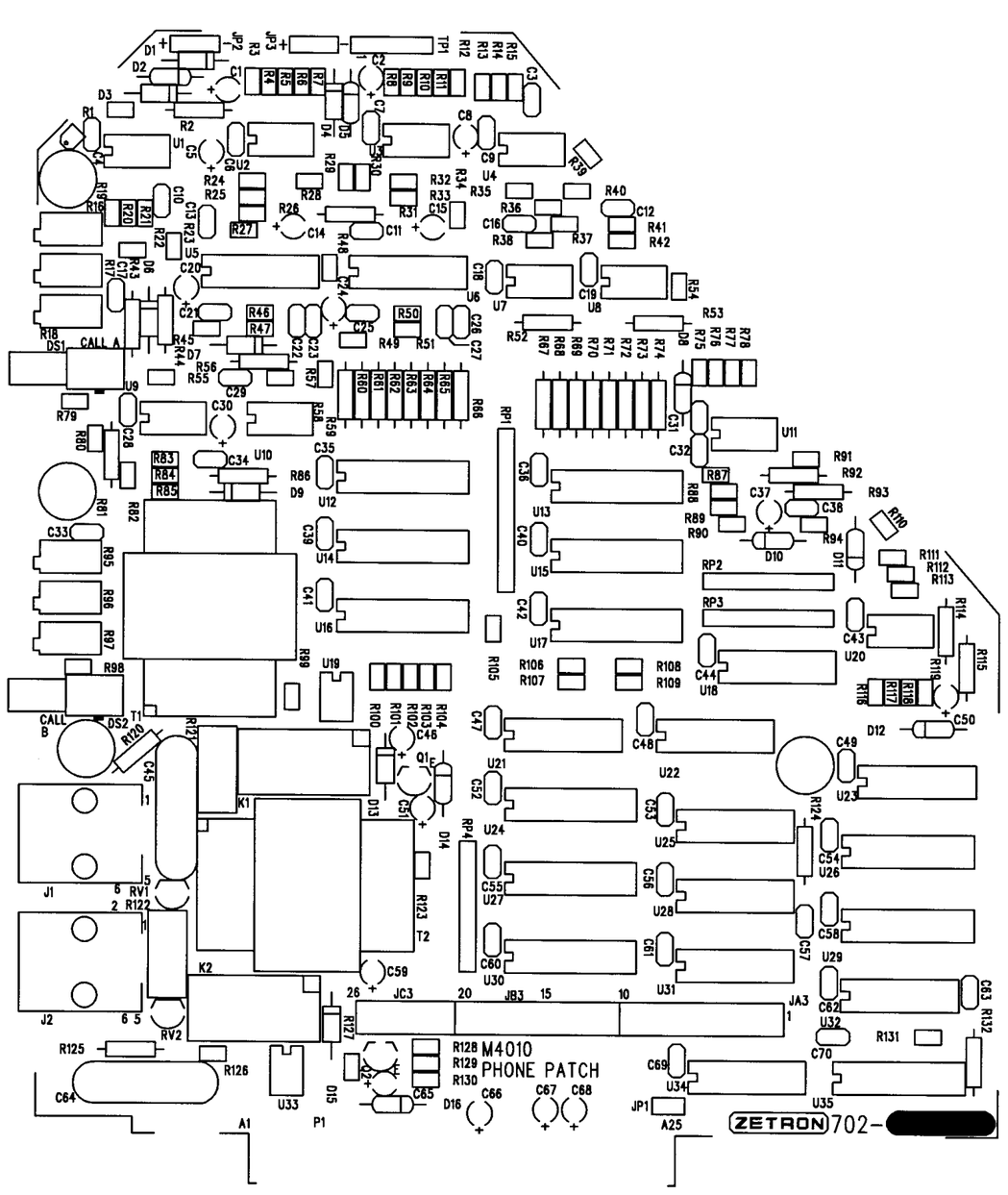
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON MODEL 4010 PHONE PATCH, SINGLE BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	2	R2,R44#,R56#,R86	101-0066	RESISTOR,510 OHM,1/4W,5%,CARBON FILM	510
2	1	R31	101-0087	RESISTOR,3.9K OHM,1/4W,5%,CARBON FILM	3.9K
3	2	R92,R93,R114#,R115#	101-0092	RESISTOR,6.2K OHM,1/4W,5%,CARBON FILM	6.2K
4	2	R52#,R53,R65#,R72	101-0100	RESISTOR,13K OHM,1/4W,5%,CARBON FILM	13K
5	1	R68,R62#	101-0104	RESISTOR,20K OHM,1/4W,5%,CARBON FILM	20K
6	1	R120,R125#	101-0105	RESISTOR,22K OHM,1/4W,5%,CARBON FILM	22K
7	1	R74,R66#	101-0109	RESISTOR,33K OHM,1/4W,5%,CARBON FILM	33K
8	1	R67,R59#	101-0114	RESISTOR,51K OHM,1/4W,5%,CARBON FILM	51K
9	2	R43,R64#,R73,R81#	101-0119	RESISTOR,82K OHM,1/4W,5%,CARBON FILM	82K
10	1	R69,R60#	101-0123	RESISTOR,120K OHM,1/4W,5%,CARBON FILM	120K
11	1	R70,R61#	101-0129	RESISTOR,220K OHM,1/4W,5%,CARBON FILM	220K
12	1	R71,R63#	101-0133	RESISTOR,330K OHM,1/4W,5%,CARBON FILM	330K
13	1	R124,R132#	101-0141	RESISTOR,680K OHM,1/4W,5%,CARBON FILM	680K
14	1	RV1,RV2#	105-3100	SIDACTOR,275-350VDC,250 AMP,TO-92	250AMP
15	1	R121,R122#	106-6015	POLYSWITCH,TELCO	600-150
16	1	R18,R97#	108-1501	POT,2K OHM,10 TURN,R/A	2K 10T
17	1	R16,R95#	108-1502	POT,5K OHM,10 TURN,R/A	5K 10T
18	1	R17,R96#	108-1503	POT,50K OHM,10 TURN,R/A	50K 10T
19	1	R12,R6#	109-0046	RESISTOR,75 OHM,1/8W,5%,CARBON FILM	75 1/8W
20	1	R19,R84#	109-0049	RESISTOR,100 OHM,1/8W,5%,CARBON FILM	100 1/8W
21	9	R4#,R8,R20,R22,R75, R79,R80#,R85#,R94#, R98#,R103#,R104#,R106, R107,R108#,R109,R123,R130#	109-0073	RESISTOR,1.0K OHM,1/8W,5%,CARBON FILM	1.0K 1/8W
22	1	R21,R83#	109-0075	RESISTOR,1.5K OHM,1/8W,5%,CARBON FILM	1.5K 1/8W
23	1	R91,R113#	109-0081	RESISTOR,2.2K OHM,1/8W 5%,CARBON FILM	2.2K 1/8W
24	11	R13,R14,R24#,R33, R34,R37#,R39,R40,R42, R48#,R58#,R89,R99,R101, R105#,R116#,R126#,R128#,R131	109-0097	RESISTOR,10K OHM,1/8W,5 %,CARBON FILM	10K 1/8W
25	3	R1,R36#,R46#,R50, R54,R55#	109-0098	RESISTOR,12K OHM,1/8W,5%,CARBON FILM	12K 1/8W
26	1	R32,R28#	109-0100	RESISTOR,18K OHM,1/8W,5%,CARBON FILM	18K 1/8W
27	2	R7#,R11,R35,R57#	109-0101	RESISTOR,15K OHM,1/8W,5%,CARBON FILM	15K 1/8W
28	1	R100,R127#	109-0102	RESISTOR,20K OHM,1/8W,5%,CARBON FILM	20K 1/8W
29	1	R41,R38#	109-0107	RESISTOR,27K OHM,1/8W,5%,CARBON FILM	27K 1/8W
30	1	R51,R47#	109-0114	RESISTOR,51K OHM,1/8W,5%,CARBON FILM	51K 1/8W
31	4	R5#,R10,R78,R87, R102,R111#,R118#,R129#	109-0121	RESISTOR,100K OHM,1/8W,5%,CARBON FILM	100K 1/8W
32	3	R25#,R30,R76,R90, R110#,R119#	109-0129	RESISTOR,220K OHM,1/8W,5%,CARBON FILM	220K 1/8W
33	1	R9,R3#	109-0133	RESISTOR,330K OHM,1/8W,5%,CARBON FILM	330K 1/8W
34	2	R15,R88,R117#	109-0145	RESISTOR,1.0M OHM,1/8W,5%,CARBON FILM	1.0M 1/8W
35	2	R45#,R49,R77,R112#	109-0160	RESISTOR,10M OHM,1/8W,5%,CARBON FILM	10M 1/8W
36	1	R27	109-0512	RESISTOR,5.1K OHM,1/8W,5%,CARBON FILM	5.1K 1/8W
37	1	R29,R26#	109-1203	RESISTOR,120K OHM,1/8W,5% CARBON FILM	120K 1/8W
38	1	R23,R82#	109-4700	RESISTOR,470 OHM,1/8W,5%,CARBON FILM	470 1/8W
39	0	RP1#	119-0006	R-NETWORK,10K OHM x 9,BUSSED,SIP-10	10K
40	2	RP2,RP3,RP4#	119-0008	R-NETWORK,10K OHM x 7,BUSSED,SIP-08	10K
41	1	C34#,C10	151-0020	CAP,.001uF,100V,10%,CERAMIC X7R	.001
42	2	C12,C16#,C32,C38#	151-0085	CAP,.22uF,50V,20%,CERAMIC Z5U	.22
43	17	C4,C6#,C7,C9,C18#, C19,C28#,C29#,C31,C35#, C36,C39#,C40,C41#,C42, C43,C44,C47#,C48,C49, C52#,C53#,C54,C55#,C56, C58,C60#,C61#,C62#,C69,C70	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
44	7	C3,C11,C13#,C17, C21#,C22#,C23#,C25, C26,C27,C33#,C57,C63#	151-0181	CAP,.1uF,50V,10%,CERAMIC X7R	.1

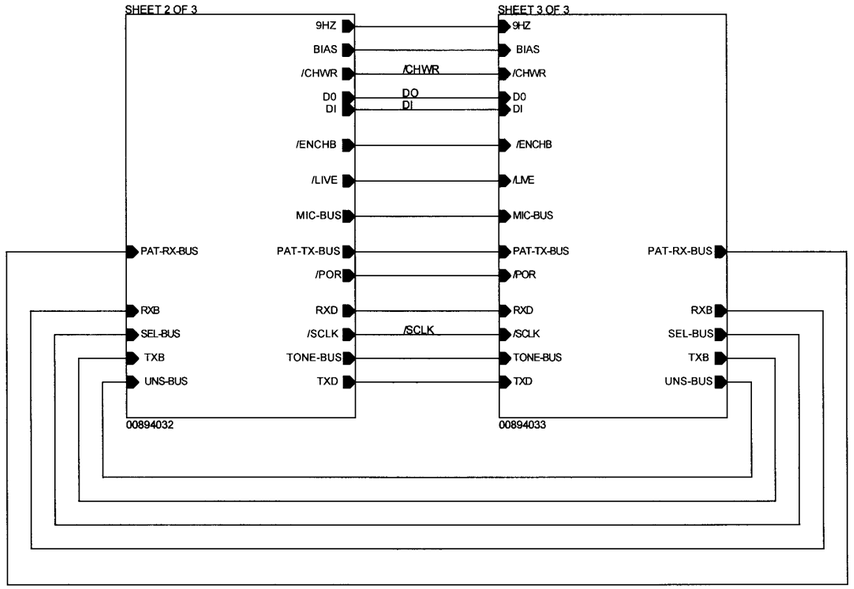
45	1	C64#,C45	152-0021	CAP,.47uF,250V,10%,POLYESTER	.47 250V
46	7	C1#,C2,C5,C8,C14#, C15,C20#,C24,C30,C51, C65#	154-0025	CAP,1uF,35V,10%,TANTALUM	1 TANT
47	5	C37,C46,C50#,C59#, C66,C67,C68	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
48	1	T1,T2#	305-1540	XFMR,TELCO HYBRID,SMALL SIZE	
49	1	DS2#,DS1	311-0009	LED,GREEN,DIFFUSED,T1-3/4	
50	1	U19,U33#	311-1001	OPTO ISOLATOR,BI-POLAR	H11AA1
51	3	U1,U4,U7#,U8,U9#, U10#	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
52	2	U2#,U3,U11,U20#	316-0662	OP-AMP,CMOS,DUAL,DIP-8	C662
53	1	U28,U31#	323-4001	NOR,QUAD,DIP-14	4001
54	1	U13,U12#	323-4051	MUX/DEMUX,ANALOG,1-TO-8,DIP-16	4051
55	2	U14#,U15,U16#,U17	323-4053	ANALOG SWITCH,TRIPLE SPDT,DIP-16	4053
56	2	U24#,U26,U27#,U29	323-4094	SERIAL REGSISTER,8 STAGE,DIP-16	4094
57	2	U18,U21#,U23,U25#	323-4906	LEVEL SHIFTER,HEX,DIP-14	74C906
58	1	U34	324-4125	BUFFER,3-STATE,ACTIVE LOW OUTPUT ENABLES,QUAD	74HC125
59	1	U35,U30#	324-4165	SIP-INPUT,SERIAL OUTPUT 8-BIT SR,HC	74HC165
60	1	U22,U32#	324-7414	INVERTER,SCHMITT,MOTOROLA THRESHOLDS,HEX,DIP-14	74HC14
61	1	Q1,Q2#	340-0014	XSTR,NPN,DARLINGTON,0.5A 30V,BETA >10,000,TO-92	MPSA14
62	1	D13,D15#	342-0001	DIODE,SILICON,1A,100V,D0-41	1N4002
63	4	D2#,D5,D8,D10,D11#, D12#,D14,D16#	342-0103	DIODE,SCHOTTKY,0.37V @ 1MA TYP	SD103A
64	1	D4,D3#	343-3030	DIODE,ZENER,6.2V,1W,5%	6.2V
65	2	D1,D6#,D7#,D9	343-3035	DIODE,ZENER,12V,1W,5%	12V
66	1	U6,U5#	376-5001	VOLTAGE CONTROLLED OSCILLATOR	2207 VCO
67	1	K1,K2#	380-0030	RELAY,DPDT,12 V COIL,MINI-DIP	
68	1	J1,J2#	401-0080	6-PIN LO PRO R/A TELCO	
69	1	JP1	403-0002	02 OF 401-0052	
70	1	JP3,JP2#	403-0003	03 OF 401-0052	
71	1	TP1	403-0005	05 OF 401-0052	
72	0	JA3#,JB3#	407-0110	SKT,SIP-10 PIN	
73	0	JC3#	407-0112	SKT,SIP-6 PIN	
74	2	XJP1 **(IN)** XJP3 **(POS +)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
75	1	XU19	407-0006	SKT, 06 PIN DIP	
76	2	XU1,4	407-0008	SKT, 08 PIN DIP	
77	1	PCB	410-9403D	MODEL 4010 PHONE PATCH	
78	1	XDS1	417-0010	LED MOUNT RA	

Single Phone Patch Card Silkscreen



Single Phone Patch Card Schematic (008-9403H)

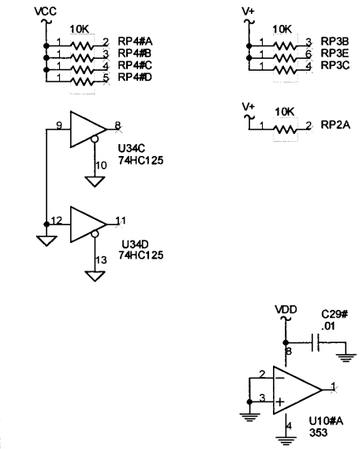
REV	DESCRIPTION	DRN	CHK	APD	DATE
H	ECN 5744	KM	MM	KMS	4/24/00



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS. 1/4 WATT. 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

ANALOG GROUND
DIGITAL GROUND
CHASSIS GROUND

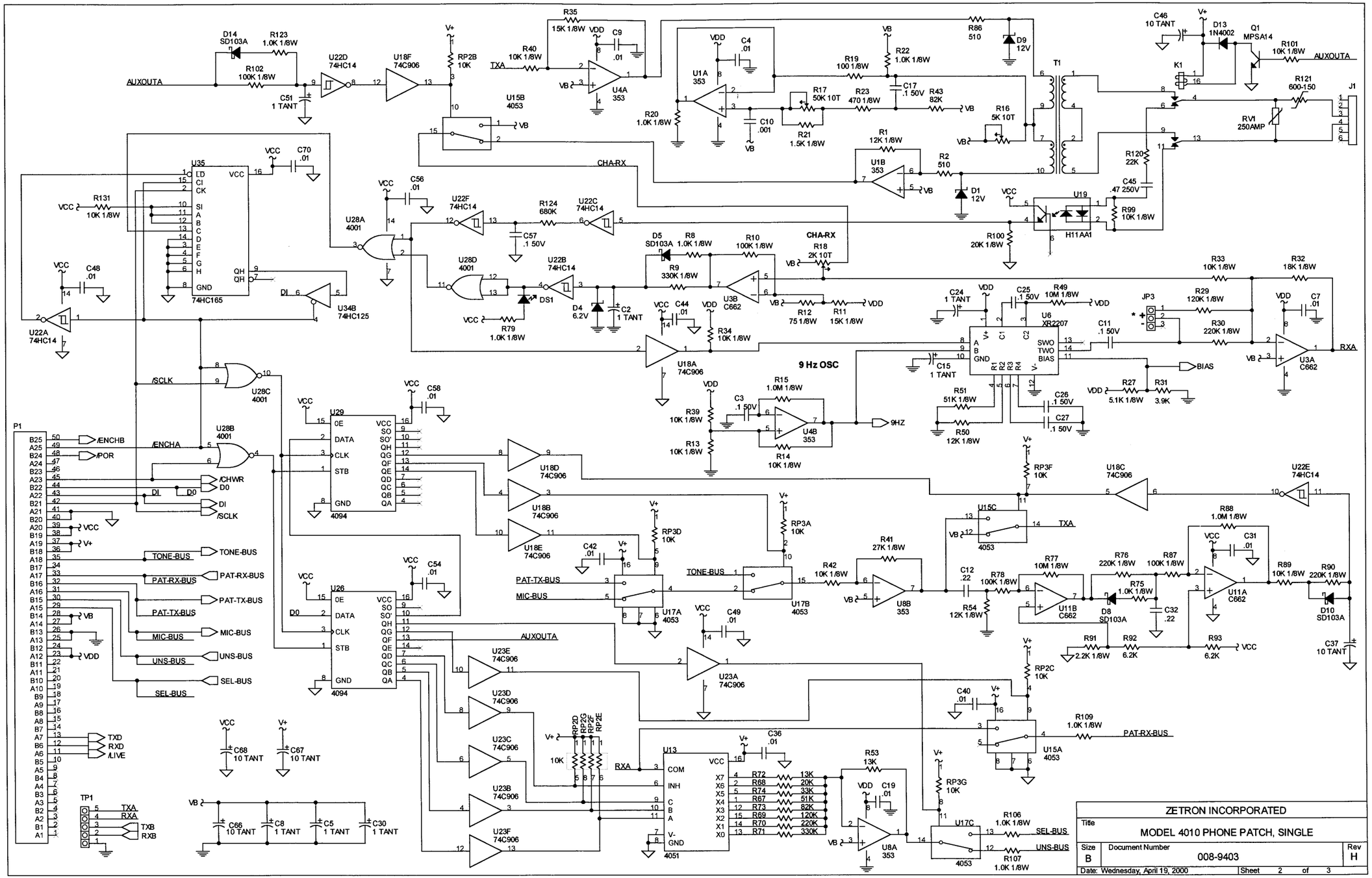
+	OPTION, INSTALL PER CUSTOMER ORDER
#	NOT INSTALLED
^	INSTALL ON HIGHER ASSEMBLY
=	SUBSTITUTE PART
•	JUMPER POSITION DEFAULT
___ X ___	CUT TRACE (REWORK)
----------	JUMPER WIRE (REWORK)
X	CUTTABLE JUMPER
X	CUTTABLE TRACE

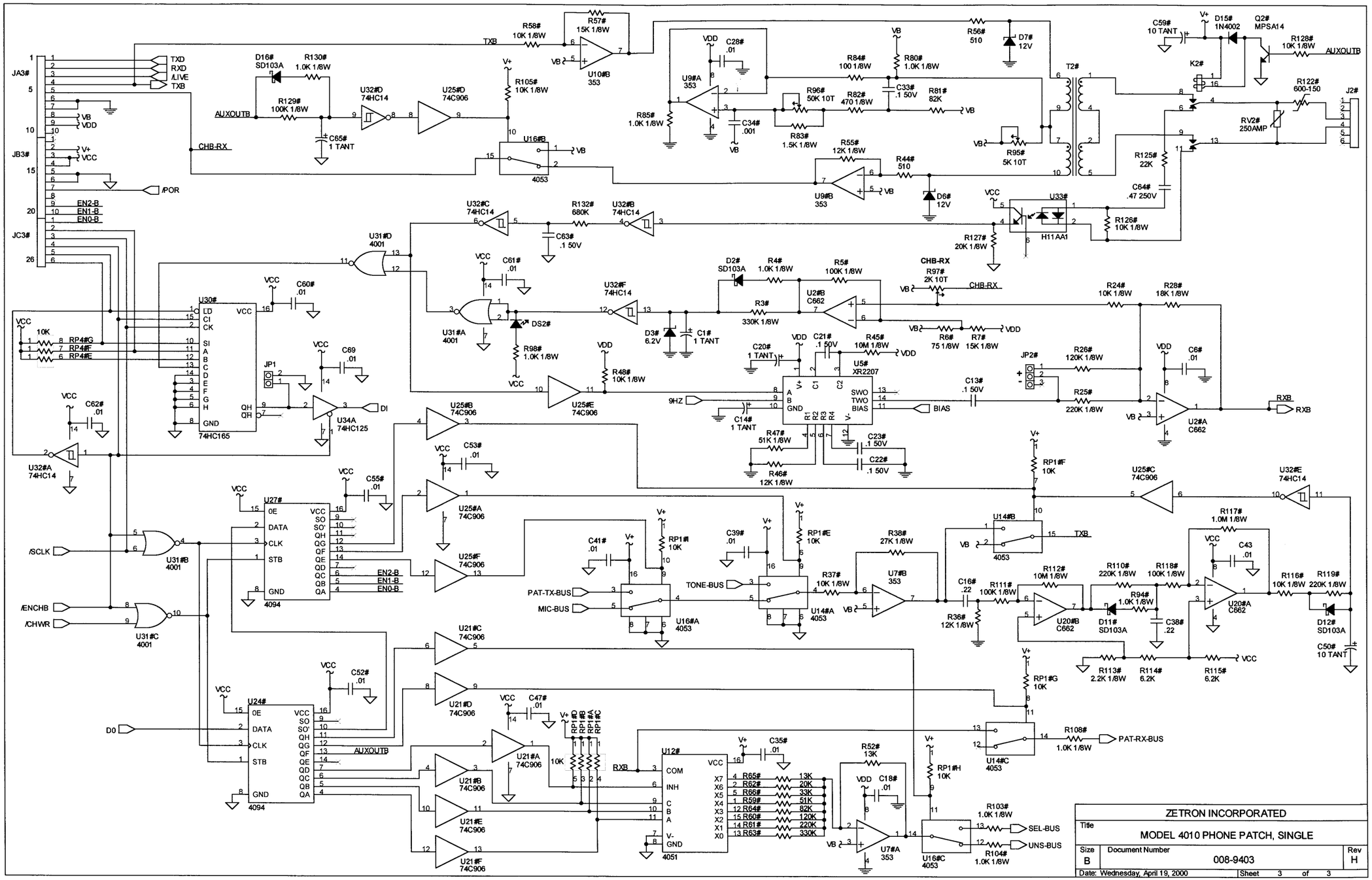
ZETRON INCORPORATED
P.O. BOX 97004
REDMOND, WASHINGTON 98073-9704

Title: MODEL 4010 PHONE PATCH, SINGLE

Size	Document Number	Rev
B	008-9403	H

Date: Tuesday, April 18, 2000 Sheet 1 of 3


AUXOUTA
CHA-RX
9 Hz OSC
/SCLK
/ENCHA
/ENCHB
/POR
/CHWR
/SCLK
TONE-BUS
PAT-RX-BUS
PAT-TX-BUS
MIC-BUS
UNS-BUS
SEL-BUS
TXD
RXD
/LIVE
TXA
RXA
TXB
RXB
BIAS
9HZ
PAT-RX-BUS
SEL-BUS
UNS-BUS
ZETRON INCORPORATED
MODEL 4010 PHONE PATCH, SINGLE
008-9403
Size B
Rev H
Date: Wednesday, April 19, 2000
Sheet 2 of 3


JA3#
JB3#
JC3#
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RXD
/LIVE
TXB
/POR
EN2-B
EN1-B
EN0-B
VB
VDD
V+
VCC
CHB-RX
AUXOUTB
TXB
R58# 10K 1/8W
R57# 15K 1/8W
U10#B 353
D16# SD103A
R130# 1.0K 1/8W
R129# 100K 1/8W
C65# 1 TANT
U32#D 74HC14
U25#D 74C906
R105# 10K 1/8W
U16#B 4053
R85# 1.0K 1/8W
U9#A 353
C28# .01
C34# .001
R96# 50K 10T
R83# 1.5K 1/8W
R84# 100 1/8W
R82# 470 1/8W
R80# 1.0K 1/8W
C33# .1 50V
R81# 82K
R56# 510
D7# 12V
R95# 5K 10T
R55# 12K 1/8W
U9#B 353
R44# 510
D6# 12V
T2#
C59# 10 TANT
D15# 1N4002
Q2# MPSA14
R128# 10K 1/8W
K2#
R122# 600-150
RV2# 250AMP
J2#
R125# 22K
C64# .47 250V
U33#
H11AA1
R126# 10K 1/8W
R127# 20K 1/8W
U32#C 74HC14
R132# 680K
U32#B 74HC14
C63# .1 50V
U31#D 4001
U31#A 4001
C61# .01
D2# SD103A
R4# 1.0K 1/8W
R5# 100K 1/8W
R97# 2K 10T
U32#F 74HC14
R3# 330K 1/8W
U2#B C662
DS2#
R98# 1.0K 1/8W
D3# 6.2V
C1# 1 TANT
R6# 75 1/8W
R7# 15K 1/8W
U30#
74HC165
C60# .01
C69 .01
JP1
U34A 74HC125
DI
C62# .01
U32#A 74HC14
U25#E 74C906
R48# 10K 1/8W
C20# 1 TANT
C21# .1 50V
R45# 10M 1/8W
U5# XR2207
C14# 1 TANT
R47# 51K 1/8W
R46# 12K 1/8W
C23# .1 50V
C22# .1 50V
C13# .1 50V
BIAS
9HZ
JP2#
R26# 120K 1/8W
R25# 220K 1/8W
R24# 10K 1/8W
R28# 18K 1/8W
C6# .01
U2#A C662
RXB
U25#B 74C906
C53# .01
U25#A 74C906
C55# .01
U27# 4094
EN2-B
EN1-B
EN0-B
/SCLK
/ENCHB
/CHWR
U31#B 4001
U31#C 4001
C41# .01
PAT-TX-BUS
MIC-BUS
U16#A 4053
RP1#I 10K
C39# .01
TONE-BUS
RP1#E 10K
R37# 10K 1/8W
U14#A 4053
R38# 27K 1/8W
U7#B 353
C16# .22
R36# 12K 1/8W
R111# 100K 1/8W
R112# 10M 1/8W
U20#B C662
R110# 220K 1/8W
R94# 1.0K 1/8W
D11# SD103A
C38# .22
R118# 100K 1/8W
U20#A C662
R117# 1.0M 1/8W
C43 .01
R116# 10K 1/8W
R119# 220K 1/8W
D12# SD103A
C50# 10 TANT
R113# 2.2K 1/8W
R114# 6.2K
R115# 6.2K
U14#B 4053
TXB
RP1#F 10K
U25#C 74C906
U32#E 74HC14
U24# 4094
D0
AUXOUTB
U21#C 74C906
U21#D 74C906
U21#A 74C906
U21#B 74C906
U21#E 74C906
U21#F 74C906
C47# .01
RP1#D RP1#B RP1#A RP1#C
10K
U12# 4051
RXB
C35# .01
R65# 13K
R62# 20K
R66# 33K
R59# 51K
R64# 82K
R60# 120K
R61# 220K
R63# 330K
R52# 13K
C18# .01
U7#A 353
RP1#H 10K
U16#C 4053
R103# 1.0K 1/8W
SEL-BUS
R104# 1.0K 1/8W
UNS-BUS
RP1#G 10K
R108# 1.0K 1/8W
PAT-RX-BUS
U14#C 4053
ZETRON INCORPORATED
MODEL 4010 PHONE PATCH, SINGLE
Size B
Document Number 008-9403
Rev H
Date: Wednesday, April 19, 2000
Sheet 3 of 3

DUAL PHONE PATCH OPTION (950-9720)

Dual Phone Patch Parts List (702-9522G)

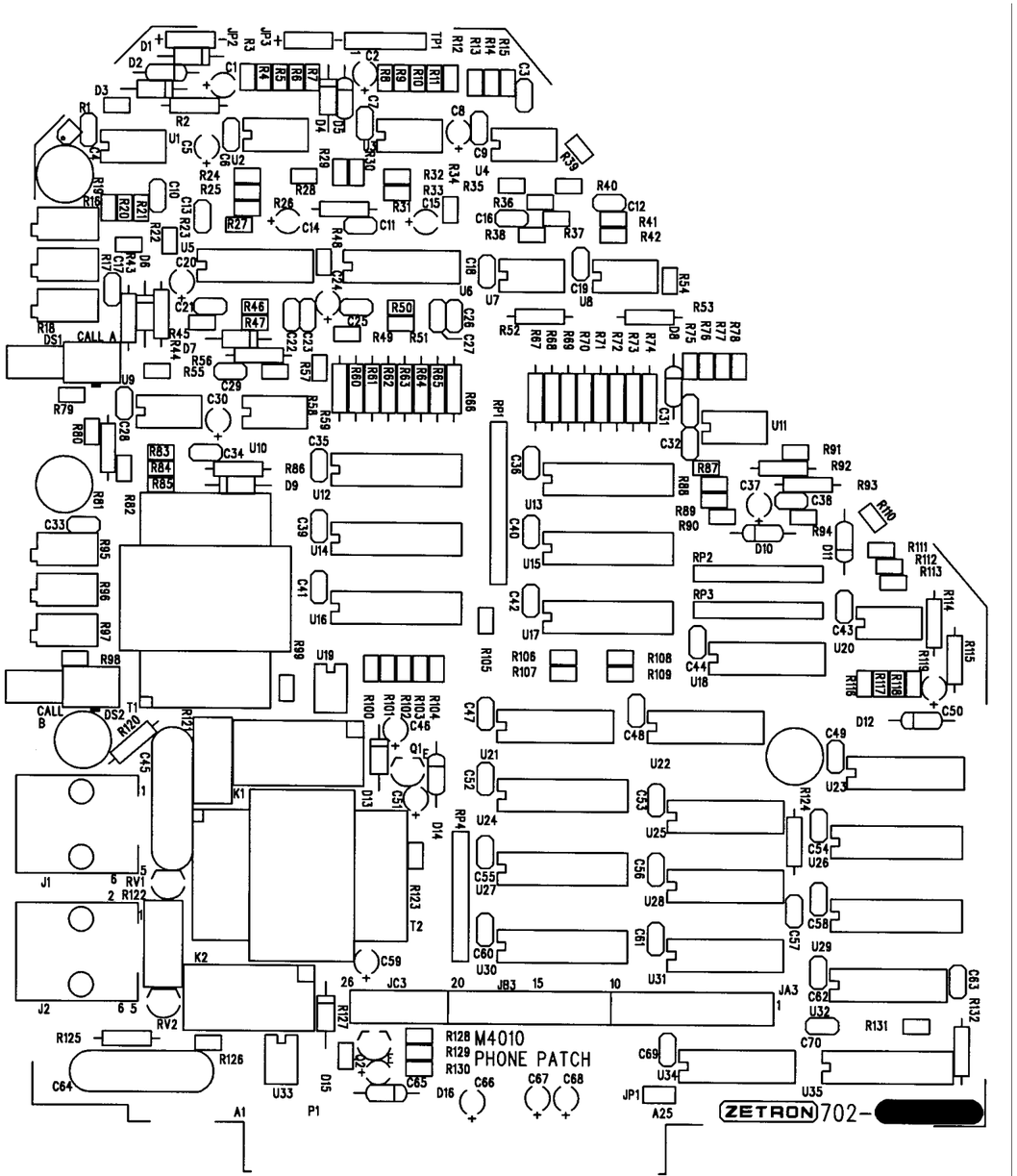
LEGEND:
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON MODEL 4010 PHONE PATCH, DUAL BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	4	R2,R44,R56,R86	101-0066	RESISTOR,510 OHM,1/4W,5%,CARBON FILM	510
2	1	R31	101-0087	RESISTOR,3.9K OHM,1/4W,5%,CARBON FILM	3.9K
3	4	R92,R93,R114,R115	101-0092	RESISTOR,6.2K OHM,1/4W,5%,CARBON FILM	6.2K
4	4	R52,R53,R65,R72	101-0100	RESISTOR,13K OHM,1/4W,5%,CARBON FILM	13K
5	2	R68,R62	101-0104	RESISTOR,20K OHM,1/4W,5%,CARBON FILM	20K
6	2	R120,R125	101-0105	RESISTOR,22K OHM,1/4W,5%,CARBON FILM	22K
7	2	R74,R66	101-0109	RESISTOR,33K OHM,1/4W,5%,CARBON FILM	33K
8	2	R67,R59	101-0114	RESISTOR,51K OHM,1/4W,5%,CARBON FILM	51K
9	4	R43,R64,R73,R81	101-0119	RESISTOR,82K OHM,1/4W,5%,CARBON FILM	82K
10	2	R69,R60	101-0123	RESISTOR,120K OHM,1/4W,5%,CARBON FILM	120K
11	2	R70,R61	101-0129	RESISTOR,220K OHM,1/4W,5%,CARBON FILM	220K
12	2	R71,R63	101-0133	RESISTOR,330K OHM,1/4W,5%,CARBON FILM	330K
13	2	R124,R132	101-0141	RESISTOR,680K OHM,1/4W,5%,CARBON FILM	680K
14	2	RV1,RV2	105-3100	SIDACTOR,275-350VDC,250 AMP,TO-92	250AMP
15	2	R121,R122	106-6015	POLYSWITCH,TELCO	600-150
16	2	R18,R97	108-1501	POT,2K OHM,10 TURN,R/A	2K 10T
17	2	R16,R95	108-1502	POT,5K OHM,10 TURN,R/A	5K 10T
18	2	R17,R96	108-1503	POT,50K OHM,10 TURN,R/A	50K 10T
19	2	R12,R6	109-0046	RESISTOR,75 OHM,1/8W,5%,CARBON FILM	75 1/8W
20	2	R19,R84	109-0049	RESISTOR,100 OHM,1/8W,5%,CARBON FILM	100 1/8W
21	18	R4,R8,R20,R22,R75, R79,R80,R85,R94,R98, R103,R104,R106,R107, R108,R109,R123,R130	109-0073	RESISTOR,1.0K OHM,1/8W,5%,CARBON FILM	1.0K 1/8W
22	2	R21,R83	109-0075	RESISTOR,1.5K OHM,1/8W,5%,CARBON FILM	1.5K 1/8W
23	2	R91,R113	109-0081	RESISTOR,2.2K OHM,1/8W 5%,CARBON FILM	2.2K 1/8W
24	19	R13,R14,R24,R33,R34, R37,R39,R40,R42,R48, R58,R89,R99,R101,R105, R116,R126,R128,R131	109-0097	RESISTOR,10K OHM,1/8W,5 %,CARBON FILM	10K 1/8W
25	6	R1,R36,R46,R50, R54,R55	109-0098	RESISTOR,12K OHM,1/8W,5%,CARBON FILM	12K 1/8W
26	2	R32,R28	109-0100	RESISTOR,18K OHM,1/8W,5%,CARBON FILM	18K 1/8W
27	4	R7,R11,R35,R57	109-0101	RESISTOR,15K OHM,1/8W,5%,CARBON FILM	15K 1/8W
28	2	R100,R127	109-0102	RESISTOR,20K OHM,1/8W,5%,CARBON FILM	20K 1/8W
29	2	R41,R38	109-0107	RESISTOR,27K OHM,1/8W,5%,CARBON FILM	27K 1/8W
30	2	R51,R47	109-0114	RESISTOR,51K OHM,1/8W,5%,CARBON FILM	51K 1/8W
31	8	R5,R10,R78,R87,R102, R111,R118,R129	109-0121	RESISTOR,100K OHM,1/8W,5%,CARBON FILM	100K 1/8W
32	6	R25,R30,R76,R90, R110,R119	109-0129	RESISTOR,220K OHM,1/8W,5%,CARBON FILM	220K 1/8W
33	2	R9,R3	109-0133	RESISTOR,330K OHM,1/8W,5%,CARBON FILM	330K 1/8W
34	3	R15,R88,R117	109-0145	RESISTOR,1.0M OHM,1/8W,5%,CARBON FILM	1.0M 1/8W
35	4	R45,R49,R77,R112	109-0160	RESISTOR,10M OHM,1/8W,5%,CARBON FILM	10M 1/8W
36	1	R27	109-0512	RESISTOR,5.1K OHM,1/8W,5%,CARBON FILM	5.1K 1/8W
37	2	R29,R26	109-1203	RESISTOR,120K OHM,1/8W,5% CARBON FILM	120K 1/8W
38	2	R23,R82	109-4700	RESISTOR,470 OHM,1/8W,5%,CARBON FILM	470 1/8W
39	1	RP1	119-0006	R-NETWORK,10K OHM x 9,BUSSED,SIP-10	10K
40	3	RP2,RP3,RP4	119-0008	R-NETWORK,10K OHM x 7,BUSSED,SIP-08	10K
41	2	C34,C10	151-0020	CAP,.001uF,100V,10%,CERAMIC X7R	.001
42	4	C12,C16,C32,C38	151-0085	CAP,.22uF,50V,20%,CERAMIC Z5U	.22
43	31	C4,C6,C7,C9,C18,C19, C28,C29,C31,C35,C36, C39,C40,C41,C42,C43, C44,C47,C48,C49,C52, C53,C54,C55,C56,C58, C60,C61,C62,C69,C70	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
44	13	C3,C11,C13,C17,C21, C22,C23,C25,C26,C27, C33,C57,C63	151-0181	CAP,.1uF,50V,10%,CERAMIC X7R	.1

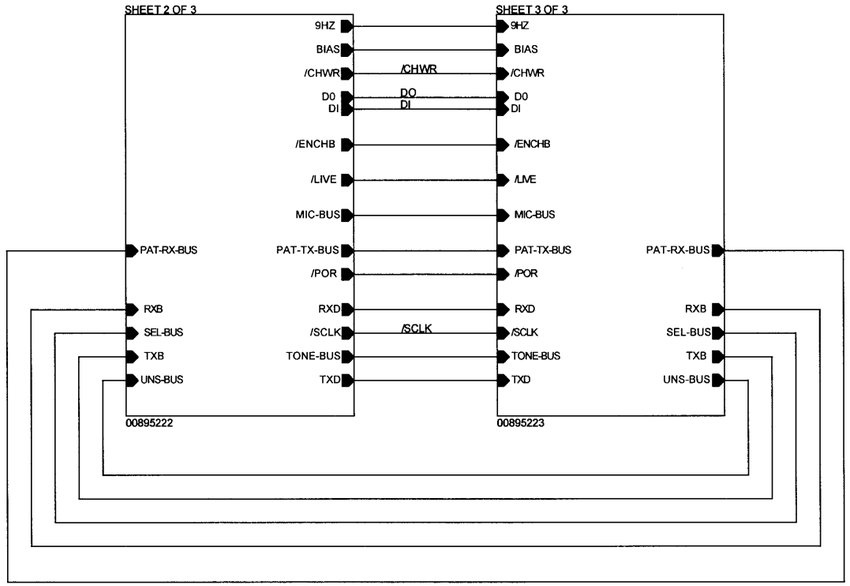
45	2	C64,C45	152-0021	CAP,.47uF,250V,10%,POLYESTER	.47 250V
46	11	C1,C2,C5,C8,C14, C15,C20,C24,C30,C51, C65	154-0025	CAP,1uF,35V,10%,TANTALUM	1 TANT
47	7	C37,C46,C50,C59, C66,C67,C68	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
48	2	T1,T2	305-1540	XFMR,TELCO HYBRID,SMALL SIZE	
49	2	DS2,DS1	311-0009	LED,GREEN,DIFFUSED,T1-3/4	
50	2	U19,U33	311-1001	OPTO ISOLATOR,BI-POLAR	H11AA1
51	6	U1,U4,U7,U8,U9,U10	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
52	4	U2,U3,U11,U20	316-0662	OP-AMP,CMOS,DUAL,DIP-8	C662
53	2	U28,U31	323-4001	NOR,QUAD,DIP-14	4001
54	2	U13,U12	323-4051	MUX/DEMUX,ANALOG,1-TO-8,DIP-16	4051
55	4	U14,U15,U16,U17	323-4053	ANALOG SWITCH,TRIPLE SPDT,DIP-16	4053
56	4	U24,U26,U27,U29	323-4094	SERIAL REGSISTER,8 STAGE,DIP-16	4094
57	4	U18,U21,U23,U25	323-4906	LEVEL SHIFTER,HEX,DIP-14	74C906
58	1	U34	324-4125	BUFFER,3-STATE,ACTIVE LOW ENABLES,QUAD,DIP-14	74HC125
59	2	U35,U30	324-4165	SIP-INPUT,SERIAL OUTPUT 8-BIT SR,HC	74HC165
60	2	U22,U32	324-7414	INVERTER,SCHMITT,MOTOROLA THRESHOLDS,HEX,DIP-14	74HC14
61	2	Q1,Q2	340-0014	XSTR,NPN,DARLINGTON,0.5A 30V,BETA >10,000,TO-92	MPSA14
62	2	D13,D15	342-0001	DIODE,SILICON,1A,100V,D0-41	1N4002
63	8	D2,D5,D8,D10,D11, D12,D14,D16	342-0103	DIODE,SCHOTTKY,0.37V @ 1MA TYP	SD103A
64	2	D4,D3	343-3030	DIODE,ZENER,6.2V,1W,5%	6.2V
65	4	D1,D6,D7,D9	343-3035	DIODE,ZENER,12V,1W,5%	12V
66	2	U6,U5	376-5001	VOLTAGE CONTROLLED OSCILLATOR	2207 VCO
67	2	K1,K2	380-0030	RELAY,DPDT,12 V COIL,MINI-DIP	
68	2	J1,J2	401-0080	6-PIN LO PRO R/A TELCO	
69	1	JP1	403-0002	02 OF 401-0052	
70	2	JP3,JP2	403-0003	03 OF 401-0052	
71	1	TP1	403-0005	05 OF 401-0052	
72	0	JA3#,JB3#	407-0110	SKT,SIP-10 PIN	
73	0	JC3#	407-0112	SKT,SIP-6 PIN	
74	3	XJP1 **(IN)** XJP2,3 **(POS +)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
75	2	XU19,33	407-0006	SKT, 06 PIN DIP	
76	4	XU1,4,9,10	407-0008	SKT, 08 PIN DIP	
77	1	PCB	410-9403D	MODEL 4010 PHONE PATCH	
78	1	XDS1	417-0010	LED MOUNT RA	

Dual Phone Patch Silkscreen



Dual Phone Patch Schematic (008-9522G)

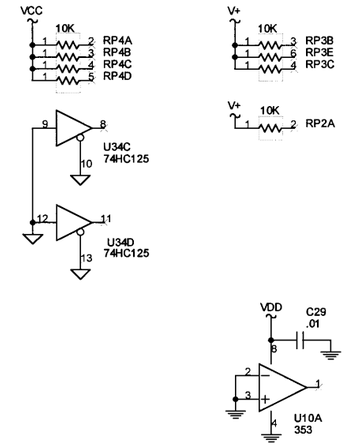
REV	DESCRIPTION	DRN	CHK	APD	DATE
G	ECN 5744	KM			7/24/00



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS. 1/4 WATT. 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

ANALOG GROUND | DIGITAL GROUND | CHASSIS GROUND

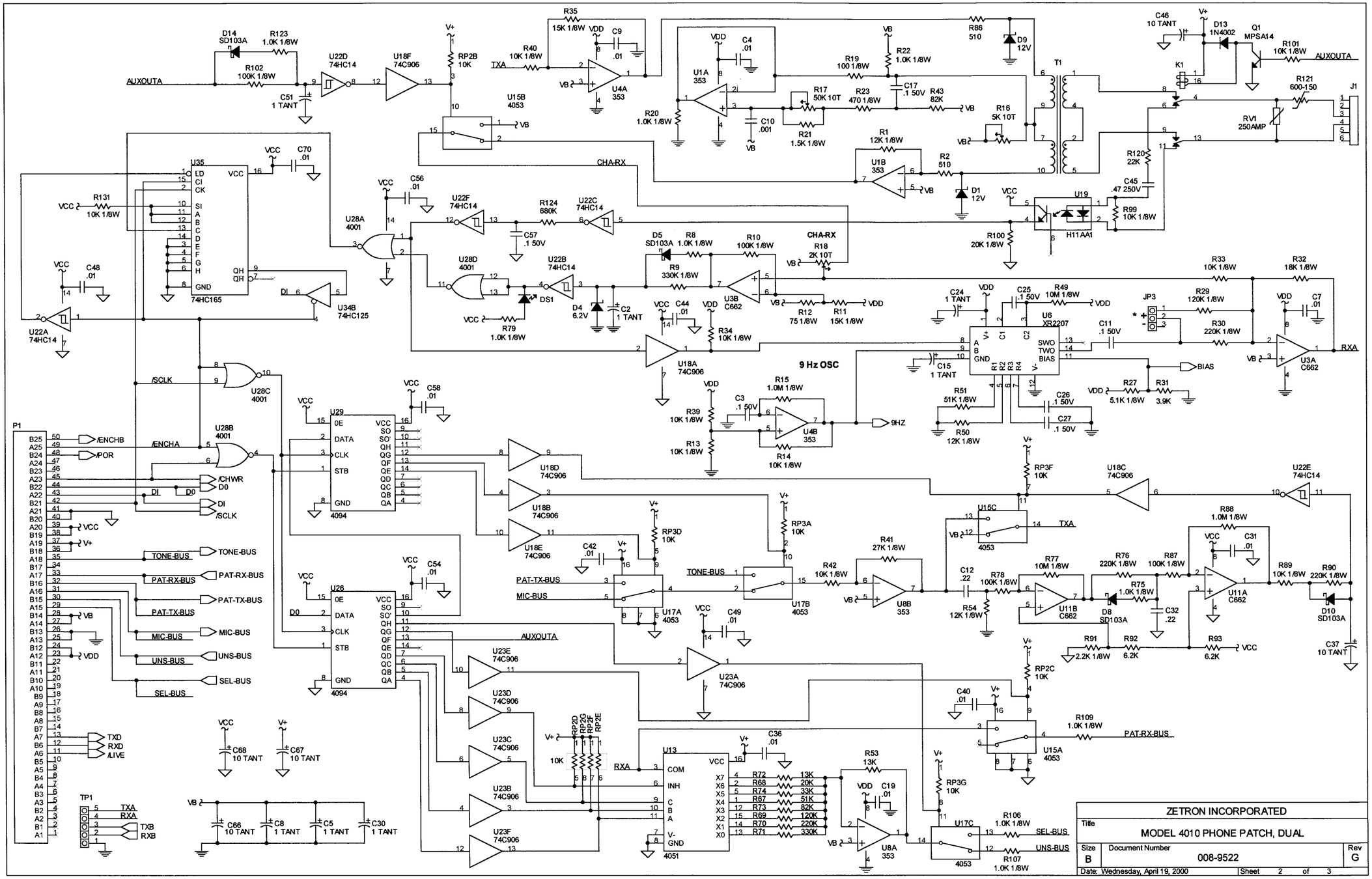
+	OPTION, INSTALL PER CUSTOMER ORDER
#	NOT INSTALLED
^	INSTALL ON HIGHER ASSEMBLY
=	SUBSTITUTE PART
•	JUMPER POSITION DEFAULT
___ X ___	CUT TRACE (REWORK)
----------	JUMPER WIRE (REWORK)
X	CUTTABLE JUMPER
X	CUTTABLE TRACE

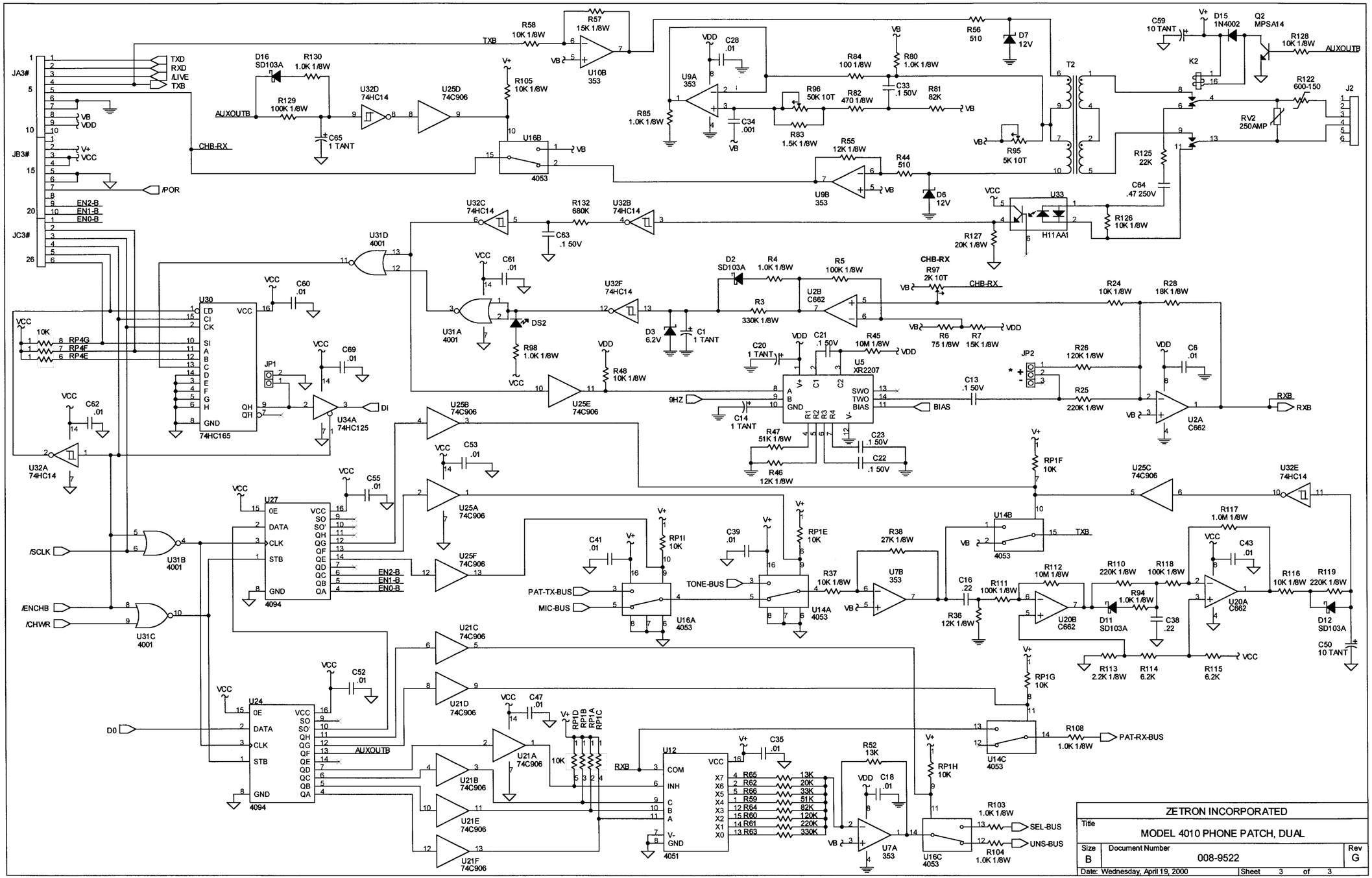
ZETRON INCORPORATED
P.O. BOX 97004
REDMOND, WASHINGTON 98073-9704

Title: MODEL 4010 PHONE PATCH, DUAL

Size	Document Number	Rev
B	008-9522	G

Date: Wednesday, April 19, 2000 | Sheet 1 of 3


9 Hz OSC
CHA-RX
AUXOUTA
TONE-BUS
PAT-RX-BUS
PAT-TX-BUS
MIC-BUS
UNS-BUS
SEL-BUS
ZETRON INCORPORATED
MODEL 4010 PHONE PATCH, DUAL
Document Number 008-9522
Rev G
Size B
Date: Wednesday, April 19, 2000
Sheet 2 of 3


JA3#
JB3#
JC3#
TXD
RXD
/LIVE
TXB
VB
VDD
V+
VCC
/POR
EN2-B
EN1-B
EN0-B
CHB-RX
AUXOUTB
R58 10K 1/8W
R57 15K 1/8W
U10B 353
D16 SD103A
R130 1.0K 1/8W
R129 100K 1/8W
C65 1 TANT
U32D 74HC14
U25D 74C906
R105 10K 1/8W
U16B 4053
U9A 353
C28 .01
R84 100 1/8W
R80 1.0K 1/8W
R85 1.0K 1/8W
R96 50K 10T
R82 470 1/8W
C33 .1 50V
R81 82K
C34 .001
R83 1.5K 1/8W
R56 510
D7 12V
R95 5K 10T
T2
C59 10 TANT
D15 1N4002
Q2 MPSA14
R128 10K 1/8W
K2
R122 600-150
RV2 250AMP
J2
R125 22K
C64 .47 250V
U33
H11AA1
R126 10K 1/8W
R127 20K 1/8W
R55 12K 1/8W
R44 510
U9B 353
D6 12V
U32C 74HC14
R132 680K
U32B 74HC14
C63 .1 50V
U31D 4001
U30
74HC165
C60 .01
C61 .01
U31A 4001
U32F 74HC14
D2 SD103A
R4 1.0K 1/8W
R5 100K 1/8W
R3 330K 1/8W
U2B C662
R97 2K 10T
R6 75 1/8W
R7 15K 1/8W
R24 10K 1/8W
R28 18K 1/8W
DS2
R98 1.0K 1/8W
D3 6.2V
C1 1 TANT
C20 1 TANT
C21 .1 50V
R45 10M 1/8W
U5 XR2207
9HZ
C14 1 TANT
C13 .1 50V
BIAS
JP2
R26 120K 1/8W
R25 220K 1/8W
C6 .01
U2A C662
RXB
JP1
C69 .01
U34A 74HC125
DI
C62 .01
U32A 74HC14
R48 10K 1/8W
U25E 74C906
R47 51K 1/8W
R46 12K 1/8W
C23 .1 50V
C22 .1 50V
U25B 74C906
C53 .01
U25A 74C906
U25F 74C906
U27
4094
C55 .01
EN2-B
EN1-B
EN0-B
/SCLK
/ENCHB
/CHWR
U31B 4001
U31C 4001
C41 .01
RP1I 10K
PAT-TX-BUS
MIC-BUS
U16A 4053
C39 .01
RP1E 10K
TONE-BUS
R37 10K 1/8W
U14A 4053
R38 27K 1/8W
U7B 353
C16 .22
R36 12K 1/8W
U14B 4053
TXB
R112 10M 1/8W
R111 100K 1/8W
U20B C662
R110 220K 1/8W
R118 100K 1/8W
R94 1.0K 1/8W
D11 SD103A
C38 .22
U20A C662
R117 1.0M 1/8W
C43 .01
R116 10K 1/8W
R119 220K 1/8W
D12 SD103A
C50 10 TANT
R113 2.2K 1/8W
R114 6.2K
R115 6.2K
U21C 74C906
U21D 74C906
U24
4094
C52 .01
D0
AUXOUTB
C47 .01
U21A 74C906
U21B 74C906
U21E 74C906
U21F 74C906
RP1D
RP1B
RP1A
RP1C
10K
U12
4051
C35 .01
R52 13K
C18 .01
U7A 353
RP1F 10K
RP1G 10K
RP1H 10K
U14C 4053
R108 1.0K 1/8W
PAT-RX-BUS
R103 1.0K 1/8W
R104 1.0K 1/8W
SEL-BUS
UNS-BUS
U16C 4053
U25C 74C906
U32E 74HC14
R65 13K
R62 20K
R66 33K
R59 51K
R64 82K
R60 120K
R61 220K
R63 330K
ZETRON INCORPORATED
Title
MODEL 4010 PHONE PATCH, DUAL
Size B
Document Number 008-9522
Rev G
Date: Wednesday, April 19, 2000
Sheet 3 of 3

AUXILIARY I/O OPTION (950-9721)

Auxiliary I/O Board Parts List (702-9448D)

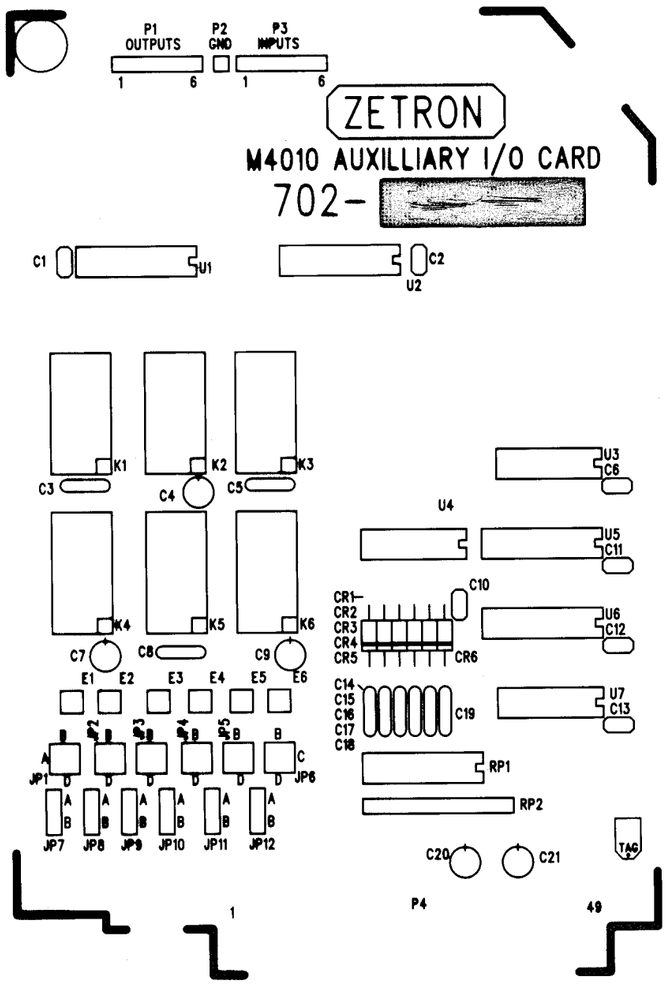
LEGEND:
= NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON MODEL 4010 AUXILLIARY I/O PARTS LIST (702-9448D)

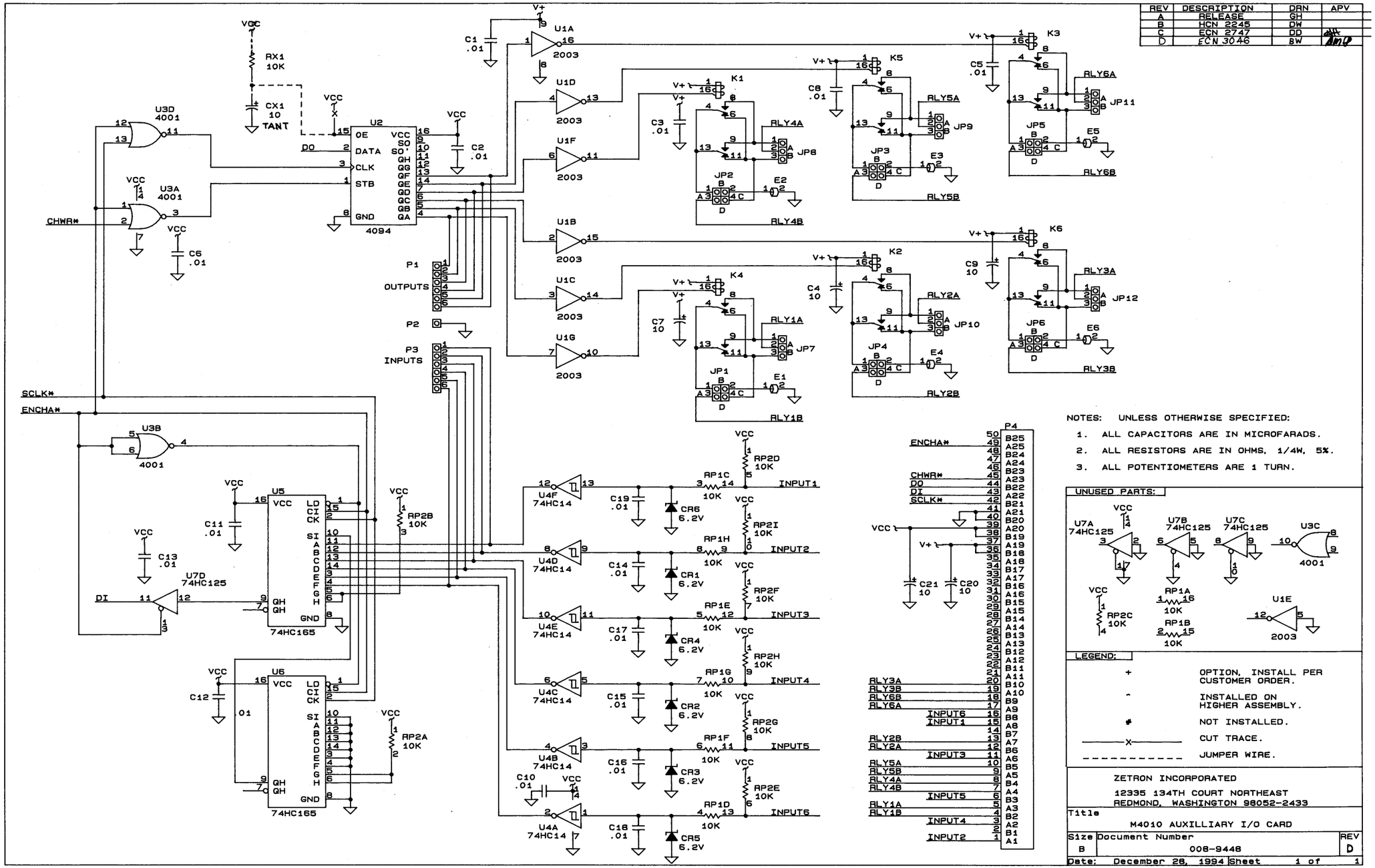
Item	Qty	Reference	Part No.	Description	Part Value
1	1	RX1 **NOTE 3**	101-0121	100K 1/4W 5% CARBON FILM	
2	1	RP2	119-0006	10K x 9 BUSSED 10-PIN SIP	
3	1	RP1	119-0024	10K X 8 ISOLATED 16-PIN DIP	
4	9	C3,C5,C8,C14,C15, C16,C17,C18,C19	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	
5	7	C1,C2,C6,C10,C11, C12,C13	151-0120	.01UF 50V/100V +-10% CERAMIC X7R	
6	1	CX1 **NOTE 4**	154-0100	10 UF 16V TANTALUM +-10%	
7	5	C4,C7,C9,C20,C21	155-0052	10 UF 35V +-20% RADIAL ALUMINUM ELECTROLYTIC	
8	6	E1,E2,E3,E4,E5,E6	305-0001	FERRITE BEADS W/ LEADS	
9	1	U3	323-4001	QUAD NOR GATE	4001
10	1	U2	323-4094	8 STAGE SERIAL REG	4094
11	1	U7	324-4125	TRI-STATE QUAD BUFFER	74HC125
12	2	U5,U6	324-4165	SERIAL IN, PARALLEL OUT, 8-BIT SHIFT REGISTER	74HC165
13	1	U4	324-7414	HEX SCHMIDT	74HC14
14	1	U1	340-2003	RELAY DRIVER 50V/.5A	2003
15	6	CR1,CR2,CR3,CR4, CR5,CR6	343-3030	ZENER, 6.2V 1W +-5%	1N4735A
16	6	K1,K2,K3,K4,K5,K6	380-0030	DPDT 12V COIL MINI RELAY 360 OHM	
17	1	P2	403-0001	1 OF 401-0052	
18	6	JP7,JP8,JP9,JP10, JP11,JP12	403-0003	3 OF 401-0052	
19	2	P1,P3	403-0006	6 OF 401-0052	
20	6	JP1,JP2,JP3,JP4, JP5,JP6	403-0202	4 OF 401-0052 [2X2]	
21	1	BRACKET **NOTE 1**	210-0001	440 KEPT NUT	
22	1	BRACKET **NOTE 1**	220-0108	440x1/4 PAN PHILLIPS	
	1	BRACKET **NOTE 1**	220-0199	632x1/4 PAN HD PHIL, BLACK	
23	1	UPPER TOP CORNER 125 HOLE **NOTE 1**	401-0614	BRACKET, RA, #6-32 TAP	
24	18	XJP1-6 **(POS B & D)** XJP7-12 **(POS A)**	402-3040	MINI JUMPER	
25	3	XU3,4,7	407-0014	SKT, 14 PIN DIP	
26	4	XU1,2,5,6	407-0016	SKT, 16 PIN DIP	
27	1	PCB	410-9448A	PCB, M4010 AUXILLIARY I/O CARD - ZETRON	

NOTES: (Notes are for production use only.)

Auxiliary I/O Board Silkscreen



Auxiliary I/O Board Schematic (008-9448D)



TONE LOTL/DTMF DECODE DAUGHTER BOARD OPTION (950-9722)

Tone LOTL/DTMF Decoder Parts List (702-9535C)

LEGEND:

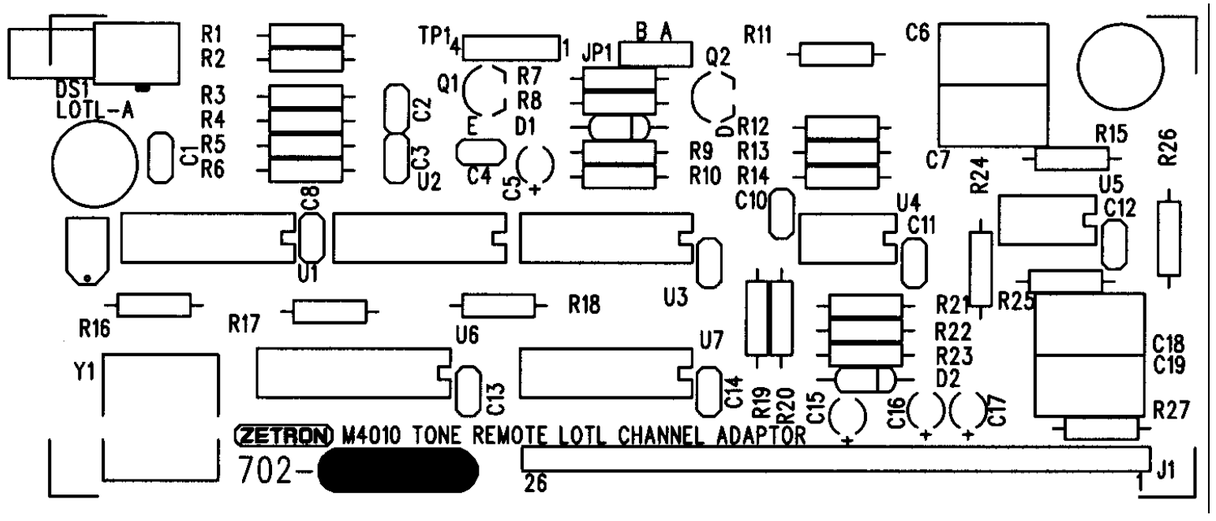
+	=	OPTION, INSTALL PER CUSTOMER ORDER
#	=	NOT INSTALLED
^	=	INSTALLED ON HIGHER ASSY
=	=	SUBSTITUTE PART

ZETRON MODEL 4010 TONE LOTL/DTMF DECODE DAUGHTER BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R2	101-0073	RESISTOR,1.0K OHM,1/4W,5%,CARBON FILM	1.0K
2	1	R13	101-0080	RESISTOR,2.0K OHM,1/4W,5%,CARBON FILM	2.0K
3	4	R1,R7,R17,R22	101-0097	RESISTOR,10K OHM,1/4W,5%,CARBON FILM	10K
4	3	R4,R6,R21	101-0104	RESISTOR,20K OHM,1/4W,5%,CARBON FILM	20K
5	1	R10	101-0106	RESISTOR,24K OHM,1/4W,5%,CARBON FILM	24K
6	1	R20	101-0107	RESISTOR,27K OHM,1/4W,5%,CARBON FILM	27K
7	2	R24,R27	101-0120	RESISTOR,91K OHM,1/4W,5%,CARBON FILM	91K
8	2	R3#,R5#,R8,R12,R18#	101-0121	RESISTOR,100K OHM,1/4W,5%,CARBON FILM	100K
9	1	R23	101-0123	RESISTOR,120K OHM,1/4W,5%,CARBON FILM	120K
10	2	R9,R19	101-0137	RESISTOR,470K OHM,1/4W,5%,CARBON FILM	470K
11	1	R14	101-0145	RESISTOR,1.0M OHM,1/4W,5%,CARBON FILM	1.0M
12	1	R16	101-0160	RESISTOR,10M OHM,1/4W,5%,CARBON FILM	10M
13	2	R11,R26	104-0047	RESISTOR,249 OHM,1/4W,1%,100PPM/C,METAL FILM	249 1%
14	2	R15,R25 **NOTE 5**	110-2103	RESISTOR,210K 0HM,1/8W,1%,100PPM/C,METAL	210K 1/8W 1%
15	2	C2,C3	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
16	9	C1,C4,C8,C9,C10, C11,C12,C13,C14	151-0180	CAP,.1uF,50V,20%,CERAMIC Z5U	.1
17	4	C6,C7,C18,C19	152-0100	CAP,.01uF,100V,2%,POLYPROPYLENE,AXIAL	.01 2%
18	1	C5	154-0025	CAP,1uF,35V,10%,TANTALUM	1 TANT
19	3	C15,C16,C17	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
20	1	DS1	311-0010	LED,RED,DIFFUSED,T1-3/4	
21	1	U4	316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
22	1	U5	316-0662	OP-AMP,CMOS,DUAL,DIP-8	C662
23	1	U1	321-0204	RCVR,DTMF,DIP-14	75T204
24	1	U6	324-4165	SIP-INPUT,SERIAL OUTPUT 8-BIT SR,HC	74HC165
25	1	U7	324-7400	NAND,HC,2 INPUT,QUAD,DIP-14	74HC00
26	1	U3	324-7414	INVERTER,SCHMITT,MOTOROLA THRESHOLDS,HEX,DIP-14	74HC14
27	1	U2	324-7474	FLIP-FLOP,D,HC,DUAL,DIP-14	74HC74
28	1	Q2	340-0201	XSTR,JFET,N-CHANNEL,VGS > -1.5,TO-92	J201
29	1	Q1	340-3904	XSTR,NPN,40V/200MA,TO92	2N3904
30	2	D1,D2	342-3009	DIODE,SILICON,100V,250MW	1N4148
31	1	Y1 **NOTE 4**	376-0358	XTAL,3.579545MHZ,CL=18pF,HC-49	3.58MHZ
32	1	JP1	403-0003	03 OF 401-0052	
33	1	TP1	403-0004	04 OF 401-0052	
34	1	J1 **NOTE 1**	403-1026	26 OF 401-0036	
35	2	**NOTE 2**	210-0001	NUT,KEP, 4-40, S-ZN	
36	2	**NOTE 2**	220-0108	440 X 1/4 PAN PHILLIPS SCREW	
37	2	**NOTE 2**	250-0103	3/4" STUD STANDOFF	
38	1	XJP1 **(POS A)**	402-3040	MINI JUMPER	
39	1	PCB **NOTE 3**	410-9450C	M4010 TONE REMOTE LOTL DAUGHTER BOARD	
40	1	XDS1	417-0010	LED MOUNT RA	

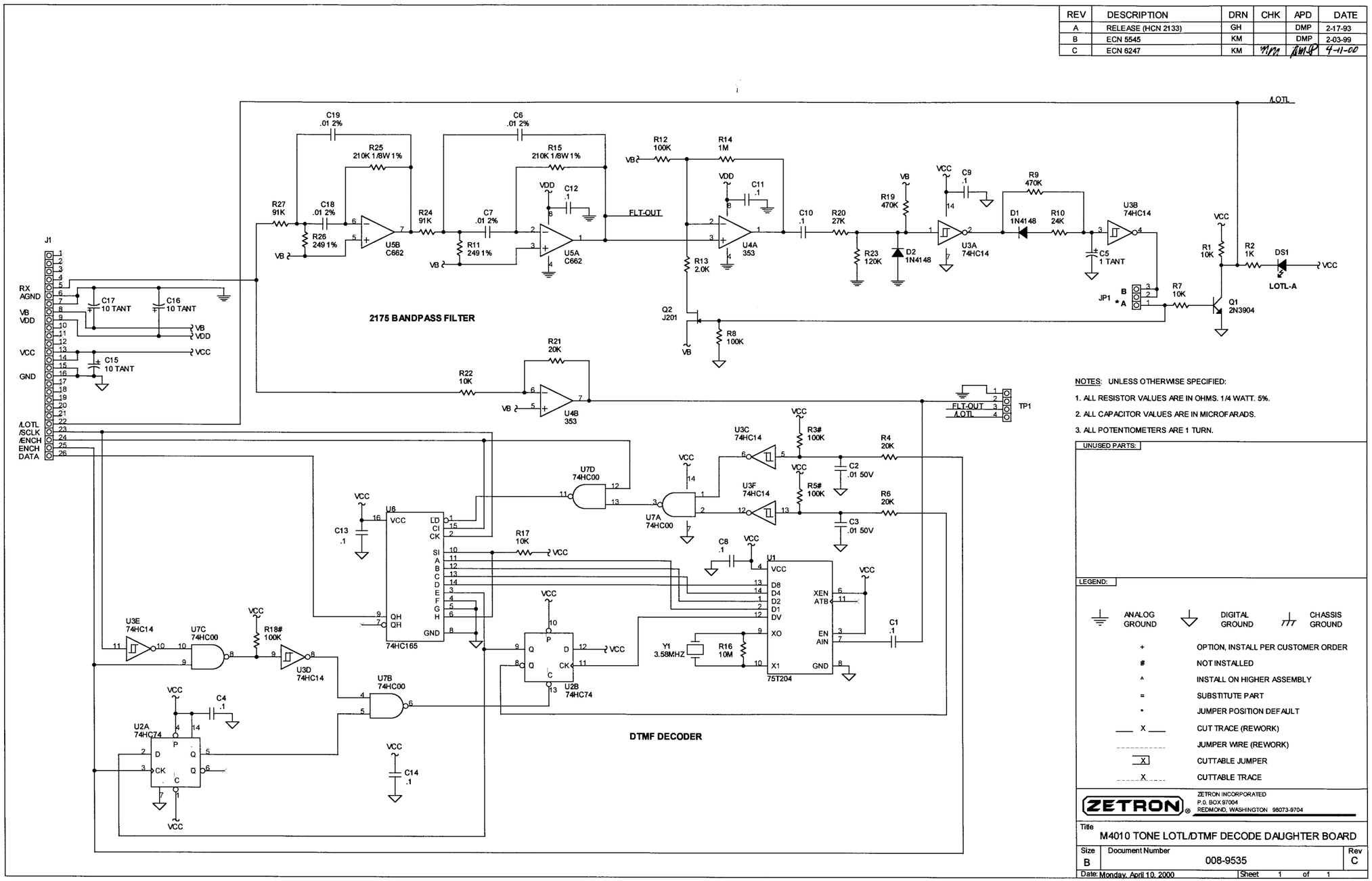
NOTES: (Notes are for production use only.)

Tone LOTL/DTMF Decoder Silkscreen



Tone LOTL/DTMF Decoder Schematic (008-9535C)

REV	DESCRIPTION	DRN	CHK	APD	DATE
A	RELEASE (HCN 2133)	GH		DMP	2-17-93
B	ECN 5545	KM		DMP	2-03-99
C	ECN 6247	KM	[illegible]	[illegible]	4-11-00



CHANNEL 5-TONE ANI DECODER OPTION (950-9707, 950-9708)

Channel 5-Tone ANI Decoder Parts List (702-0147A)

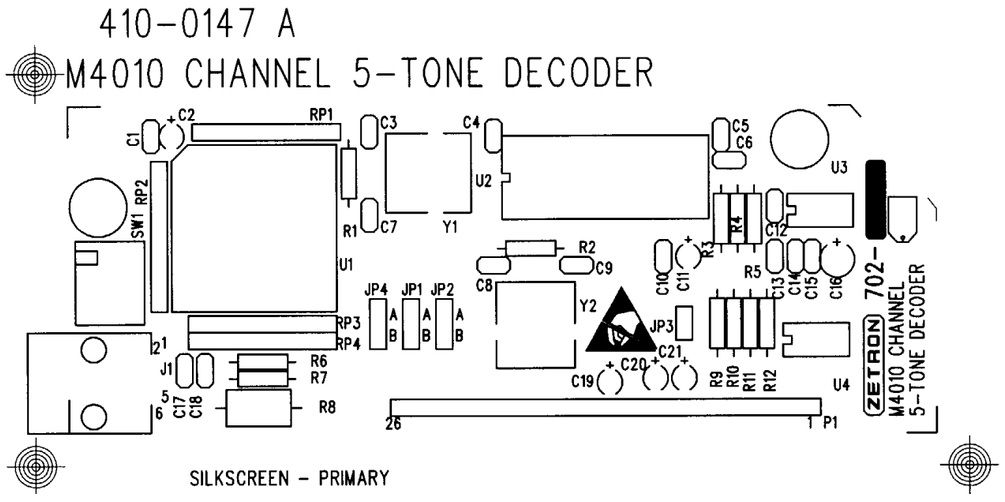
LEGEND:
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON MODEL 4010 CHANNEL 5-TONE DECODER BOARD PARTS LIST:

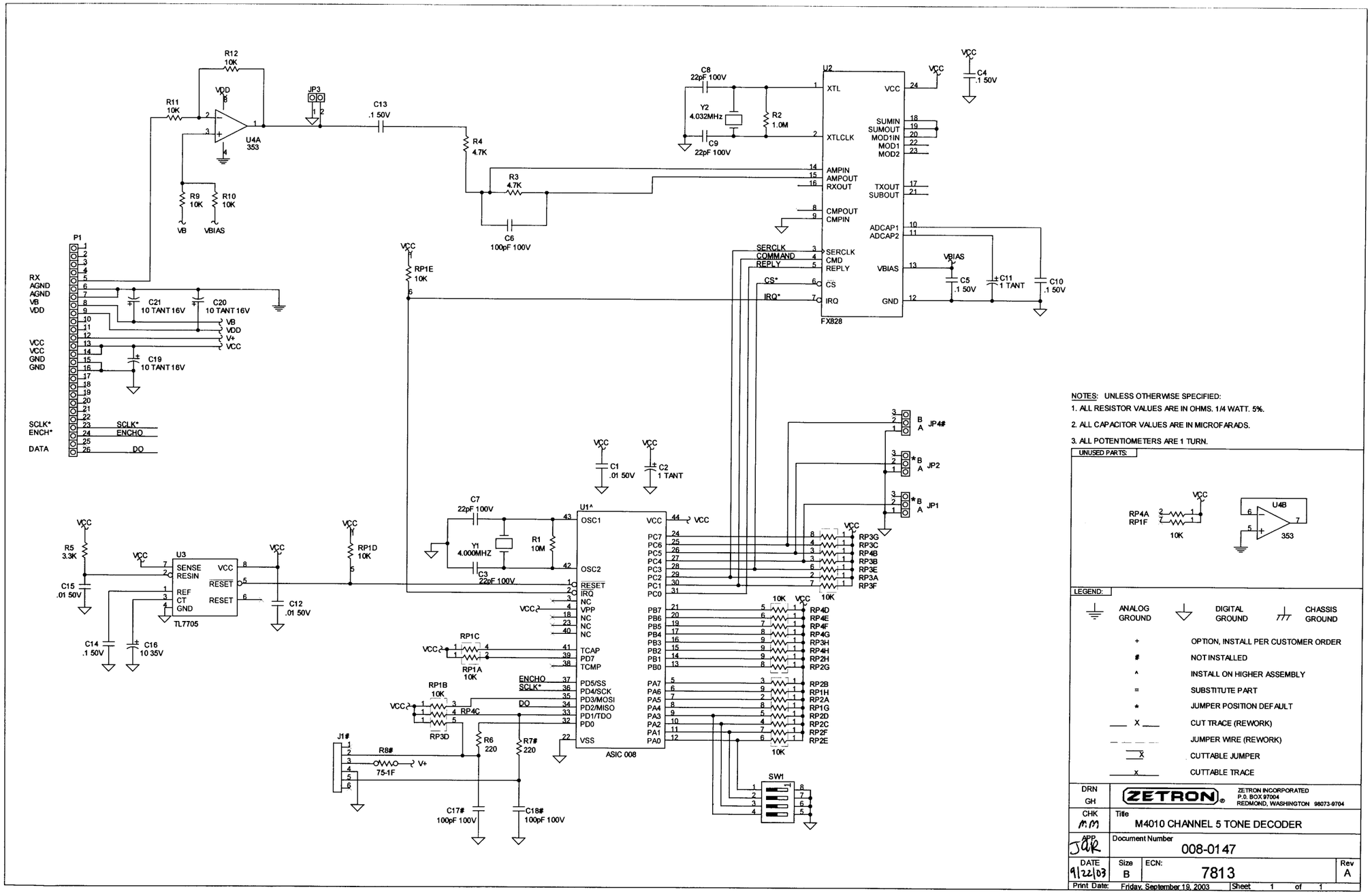
Item	Qty	Reference		Part No.	Description	Part Value
1.	1	R6,R7#		101-0057	RESISTOR,220 OHM,1/4W,5%,CARBON FILM	220
2.	1	R5		101-0085	RESISTOR,3.3K OHM,1/4W,5%,CARBON FILM	3.3K
3.	2	R3,R4		101-0089	RESISTOR,4.7K OHM,1/4W,5%,CARBON FILM	4.7K
4.	4	R9,R10,R11,R12		101-0097	RESISTOR,10K OHM,1/4W,5%,CARBON FILM	10K
5.	1	R2		101-0145	RESISTOR,1.0M OHM,1/4W,5%,CARBON FILM	1.0M
6.	1	R1		101-0160	RESISTOR,10M OHM,1/4W,5%,CARBON FILM	10M
7.	0	R8#		106-1175	RESISTOR,FUSIBLE,75 OHM,1W,5%	75 1F
8.	4	RP1,RP2,RP3,RP4		119-0056	R-NETWORK,10K OHM x 8,BUSSED,SIP-9	10K
9.	1	C6,C17#,C18#		151-0010	CAP,100pF,100V,10%,CERAMIC,NPO	100pF 100V
10.	4	C3,C7,C8,C9		151-0022	CAP,22pF,100V,10%,CERAMIC,NPO	22pF 100V
11.	3	C1,C12,C15		151-0120	CAP,.01uF,50V,10%,CERAMIC,X7R	.01 50V
12.	5	C4,C5,C10,C13,C14		151-0181	CAP,.1uF,50V,10%,CERAMIC,X7R	.1 50V
13.	2	C11,C2		154-0025	CAP,1uF,35V,10%,TANTALUM	1 35V TANT
14.	3	C19,C20,C21		154-0100	CAP,10uF,16V,10%,TANTALUM	10 16V TANT
15.	1	C16		155-0052	CAP,10uF,35V,20%,RADIAL,Al-E	10 35V
16.	1	U4		316-0353	OP-AMP,BIFET,DUAL,DIP-8	353
17.	1	U2		316-0828	ENCODER/DECODER,CTCSS,DCS,SELCALL,DIP-24	FX828
18.	1	U3		316-7705	POWER ON RESET,DIP-8	TL7705
19.	0	U1^		321-6805	8 BIT MICRO OTP (68HC705),PLCC-44	ASIC 008
20.	1	SW1		371-0025	SWITCH,DIP,04 POS,TOP ACTUATED	
21.	1	Y1		376-0004	XTAL,4.000MHZ,CL=18,20pF,HC-49	4.000MHZ
22.	1	Y2		376-4032	XTAL,4.032MHZ,CL=18,22pF,HC-49	4.032MHZ
23.	0	J1#		401-0080	6-PIN LO PRO R/A TziELCO	
24.	1	JP3		403-0002	02 OF 401-0052	
25.	2	JP1,JP2,JP4#		403-0003	03 OF 401-0052	
26.	1	P1	**NOTE 1**	405-1026	26 OF 401-0065	
27.	2	STUDS	**NOTE 2**	210-0001	440 KEP NUT PLATED	
28.	2	STUDS	**NOTE 2**	220-0108	440X1/4 PAN PHILLIPS	
29.	2		**NOTE 2**	250-0103	440X3/4 W/STUD	
30.	2	XJP1, 2	**(POS B)**	402-3040	MINI JUMPER	
31.	1	XU1		407-0044	SKT, 44 PIN PLCC	
32.	1	PCB		410-0147A	PCB, M4010 CHANNEL 5-TONE DECODER	

NOTES:
1. PINS OF P1 SHOULD EXTEND THROUGH SOLDER SIDE .70" TO .76".
2. INSTALL STUDS (250-0103) INTO MOUNTING HOLES FROM SOLDER SIDE AND SECURE WITH NUT (210-0001) ON COMPONENT SIDE .INSTALL SCREWS (220-0108) INTO STUDS.

Channel 5-Tone ANI Decoder Silkscreen



Channel 5-Tone ANI Decoder Schematic (008-0147A)



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS. 1/4 WATT. 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

ANALOG GROUND	
DIGITAL GROUND	
CHASSIS GROUND	
+	OPTION, INSTALL PER CUSTOMER ORDER
#	NOT INSTALLED
^	INSTALL ON HIGHER ASSEMBLY
=	SUBSTITUTE PART
*	JUMPER POSITION DEFAULT
___ X ___	CUT TRACE (REWORK)
_ _ _ _ _	JUMPER WIRE (REWORK)
X	CUTTABLE JUMPER
X	CUTTABLE TRACE

DRN GH	ZETRON® ZETRON INCORPORATED P.O. BOX 97004 REDMOND, WASHINGTON 98073-9704	
CHK MM	Title M4010 CHANNEL 5 TONE DECODER	
APP JAR	Document Number 008-0147	
DATE 9/22/03	Size B / ECN: 7813	Rev A
Print Date: Friday, September 19, 2003	Sheet 1 of 1	

CHANNEL ANI FSK DECODER OPTION (950-9709)

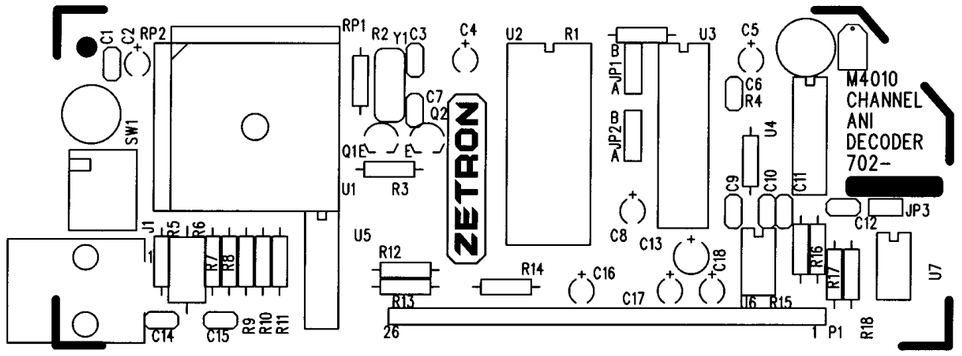
Channel ANI FSK Decoder Parts list (702-9583C.2)

LEGEND:
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

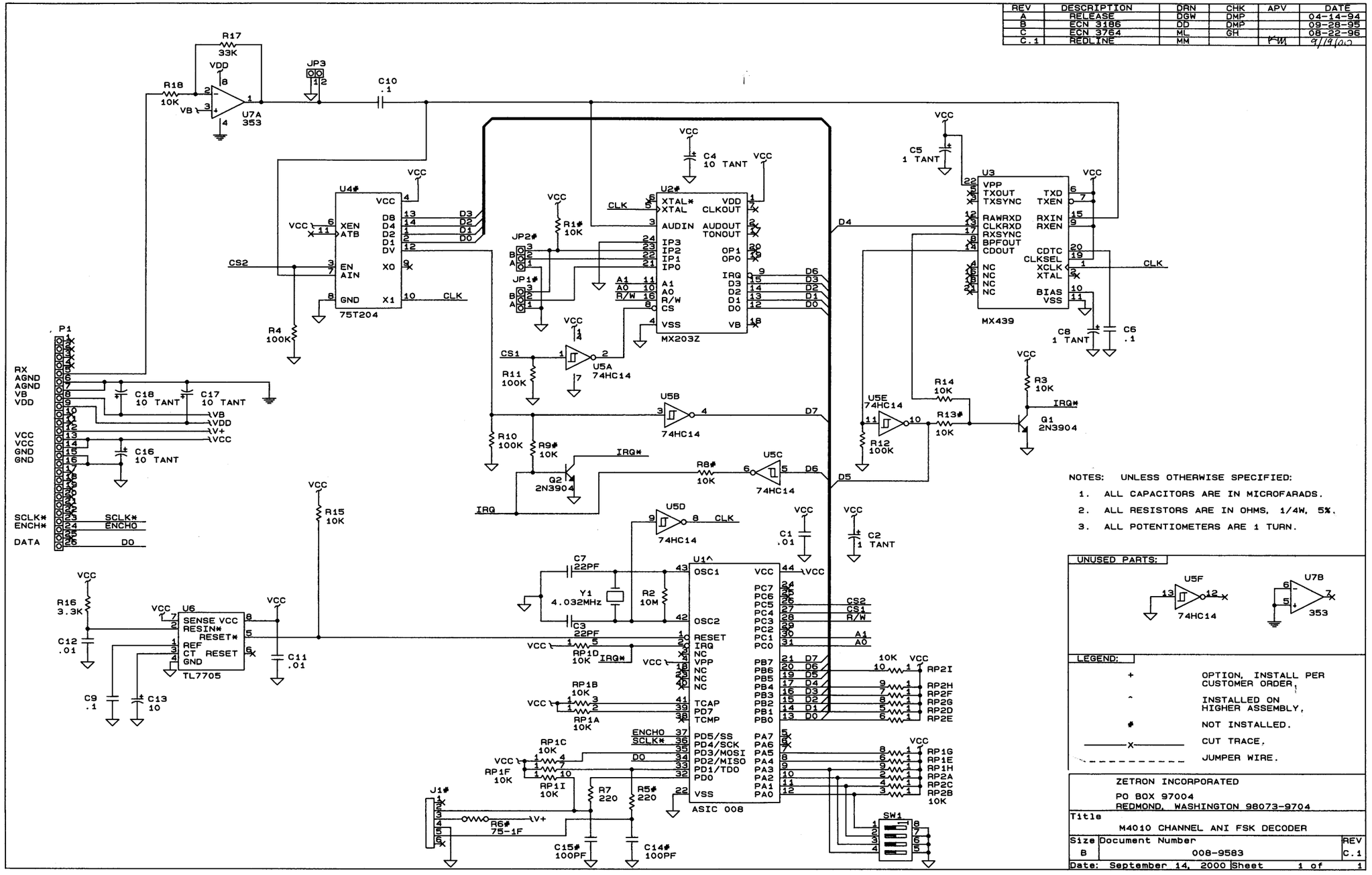
ZETRON M4010 CHANNEL ANI 'FSK' DECODER PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R7,R5#	101-0057	220 OHM 1/4W 5% CARBON FILM	
2	1	R16	101-0085	3.3K 1/4W 5% CARBON FILM	
3	4	R1#,R3,R8#,R9#,R13#, R14,R15,R18	101-0097	10K 1/4W 5% CARBON FILM	
4	1	R17	101-0109	33K 1/4W 5% CARBON FILM	
5	4	R4,R10,R11,R12	101-0121	100K 1/4W 5% CARBON FILM	
6	1	R2	101-0160	10M 1/4W 5% CARBON FILM	
7	0	R6#	106-1175	75 OHM 1W 5% FUSIBLE	BW1F-75OHM5%B
8	2	RP1,RP2	119-0006	10K x 9 R-SIP	4610X-101-103
9	0	C14#,C15#	151-0010	100PF 50V/100V +-10%/5% CERAMIC, TEMP. STABLE	CW15C101K
10	2	C3,C7	151-0022	22PF 50V +-10%/5%	CN15C220K
11	3	C1,C11,C12	151-0120	.01UF 50V +-10% CERAMIC, TEMP. STABLE	CW15C103K
12	3	C6,C9,C10	151-0181	.1UF .1SPACE 50V CERAMIC, TEMP. STABLE	CW20C104K
13	3	C2,C5,C8	154-0025	1 UF 35V TANTALUM	ECS-F-35E1
14	4	C4,C16,C17,C18	154-0100	10 UF 16V TANTALUM	ECS-FICE106K
15	1	C13	155-0052	10 UF 35V +-20% RADIAL ALUM. ELECT.	ECEA1VU100
16	0	U2#	316-0203	5/6 TONE X-CEIVER-ZVEI	MX203QZJ
17	1	U7	316-0353	DUAL OP-AMP, DUAL BIFET	LF353
18	1	U6	316-7705	POWER ON RESET	TL7705
19	0	U4#	321-0204	DTMF RECEIVER	75T204
20	1	U3	321-0439	FFSK MODEM 22 DIP	MX439P
21	0	U1^	321-6805	ASIC 008	
22	1	U5	324-7414	HEX SCHMIDT	74HC14
23	2	Q2,Q1	340-3904	NPN 40V/200MA	2N3904
24	1	SW1	371-0025	4 POS DIP SWITCH	206-4ST
25	1	Y1	376-4032	4.032 MHz HC-18 CASE	CTS MP043
26	0	J1#	401-0080	6-PIN LO PRO R/A TELCO	520250-3
27	1	JP3	403-0002	2 OF 401-0052	
28	0	JP2#,JP1#	403-0003	3 OF 401-0052	
29	1	P1 **NOTE 2**	405-1026	26 OF 401-0065	
30	3	XQ2, STUDS **NOTE 3**	210-0001	440 KEP NUT PLATED	
31	2	STUDS **NOTE 3**	220-0108	440X1/4 PAN PHILLIPS	
32	2	**NOTE 3**	250-0103	440X3/4 W/STUD	
33	1	XU1	407-0044	SKT, 44 PIN PLCC	
34	1	PCB	410-9580A	PCB, M4010 CHANNEL ANI DECODER	

Channel ANI FSK Decoder Silkscreen



Channel ANI FSK Decoder Schematic (008-9583C.1)



MODEL 4010R BOARDS

Control Board Parts List (702-9569H.1)

LEGEND:

+	=	OPTION, INSTALL PER CUSTOMER ORDER
#	=	NOT INSTALLED
^	=	INSTALLED ON HIGHER ASSY
=	=	SUBSTITUTE PART

ZETRON MODEL 4010R CONTROL BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R92	101-0025	10 OHM 1/4W 5% CARBON FILM	
2	3	R6,R20,R49	101-0049	100 OHM 1/4W 5% CARBON FILM	
3	5	R37,R43,R98,R99,R100	101-0057	220 OHM 1/4W 5% CARBON FILM	
4	3	R36,R84,R85	101-0061	330 OHM 1/4W 5% CARBON FILM	
5	2	R13,R53	101-0068	620 OHM 1/4W 5% CARBON FILM	
6	9	R2,R4,R8,R25,R30, R31,R32,R39,R91	101-0073	1K 1/4W 5%CARBON FILM	
7	6	R27,R28,R29,R58, R102,R103	101-0074	1.2K 1/4W 5% CARBON FILM	
8	1	R78	101-0085	3.3K 1/4W 5% CARBON FILM	
9	3	R5,R81,R97	101-0089	4.7K 1/4W 5% CARBON FILM	
10	21	R9,R35,R38,R48,R59, R60,R65,R66,R73,R74, R75,R76,R77,R79,R82, R83,R86,R88,R90,R95,R101	101-0097	10K 1/4W 5% CARBON FILM	
11	5	R12,R16,R21,R23,R24	101-0101	15K 1/4W 5% CARBON FILM	
12	1	R19	101-0103	18K 1/4W 5% CARBON FILM	
13	4	R14,R33,R51,R52	101-0104	20K 1/4W 5% CARBON FILM	
14	1	R89	101-0105	22K 1/4W 5% CARBON FILM	
15	1	R26	101-0106	24K 1/4W 5% CARBON FILM	
16	1	R15	101-0107	27K 1/4W 5% CARBON FILM	
17	2	R40,R72	101-0109	33K 1/4W 5% CARBON FILM	
18	1	R50	101-0111	39K 1/4W 5% CARBON FILM	
19	2	R46,R34	101-0113	47K 1/4W 5% CARBON FILM	
20	1	R3	101-0115	56K 1/4W 5% CARBON FILM	
21	15	R1,R10,R18,R22,R41, R47,R54,R55,R56,R57, R61,R64,R71,R80,R96	101-0121	100K 1/4W 5% CARBON FILM	
22	1	R45	101-0125	150K 1/4W 5% CARBON FILM	
23	2	R11,R44	101-0129	220K 1/4W 5% CARBON FILM	
24	1	R17	101-0141	680K 1/4W 5% CARBON FILM	
25	1	R42	101-0148	2M 1/4W 5%CARBON FILM	
26	1	R87	101-0160	10M 1/4W 5% CARBON FILM	
27	1	R94	103-0047	47 OHM 1W 5%	
28	1	R93	103-0175	75 OHM 2W 5%	RD-200BJ75
29	1	RV1	105-0002	VARISTOR 14V AC	V22ZA3
30	7	R7,R62,R63,R67,R68, R69,R70	108-0103	10K POT 4 TURN	1102P-1-103K
31	1	RP1	119-0003	3.3K x 7 R-SIP	4608X-101-332
32	1	RP5	119-0006	10K x 9 R-SIP	4610X-101-103
33	2	RP4,RP3	119-0008	10K x 7 R-SIP	EXB-F8E103G /J
34	1	RP2	119-0021	R/2R 100K/200K 10 PIN	RSC10L104G
35	7	C4,C5,C7,C17,C31, C32,C34,C86#	150-0096	1000 PF 1KV +-20% CERAMIC DISC	GP210
36	39	C35,C38,C40,C45, C48,C49,C50,C51,C52, C53,C56,C57,C58,C59, C60,C61,C63,C64,C65, C67,C68,C69,C71,C72, C73,C74,C75,C76,C77, C78,C79,C80,C81,C83, C84,C88,C99,C101,C103	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	DF-103Z
37	1	C27	151-0010	100PF 50V/100V +-10%/5% CERAMIC, TEMP STABLE	CW15C101K
38	2	C54,C55	151-0022	22PF 50V +-10%/5%	CN15C220K
39	4	C3,C6,C21,C22	151-0028	270PF 50V+-5% CERAMIC, TEMP STABLE	CN15C271J
40	1	C43	151-0080	.0022UF 50V+-10% CERAMIC, TEMPERATURE STABLE	CW15C222K
41	13	C9,C11,C16,C20,C33, C39,C41,C42,C44,C46, C91,C95,C97	151-0181	.1UF .1SPACE 50V CERAMIC, TEMP. STABLE	CW20C104K
42	1	C26	152-0085	.01 UF 50V +- 5%POLYESTER	ECQ-V1H103JZ

Model 4010 Radio Dispatch Console Service Manual

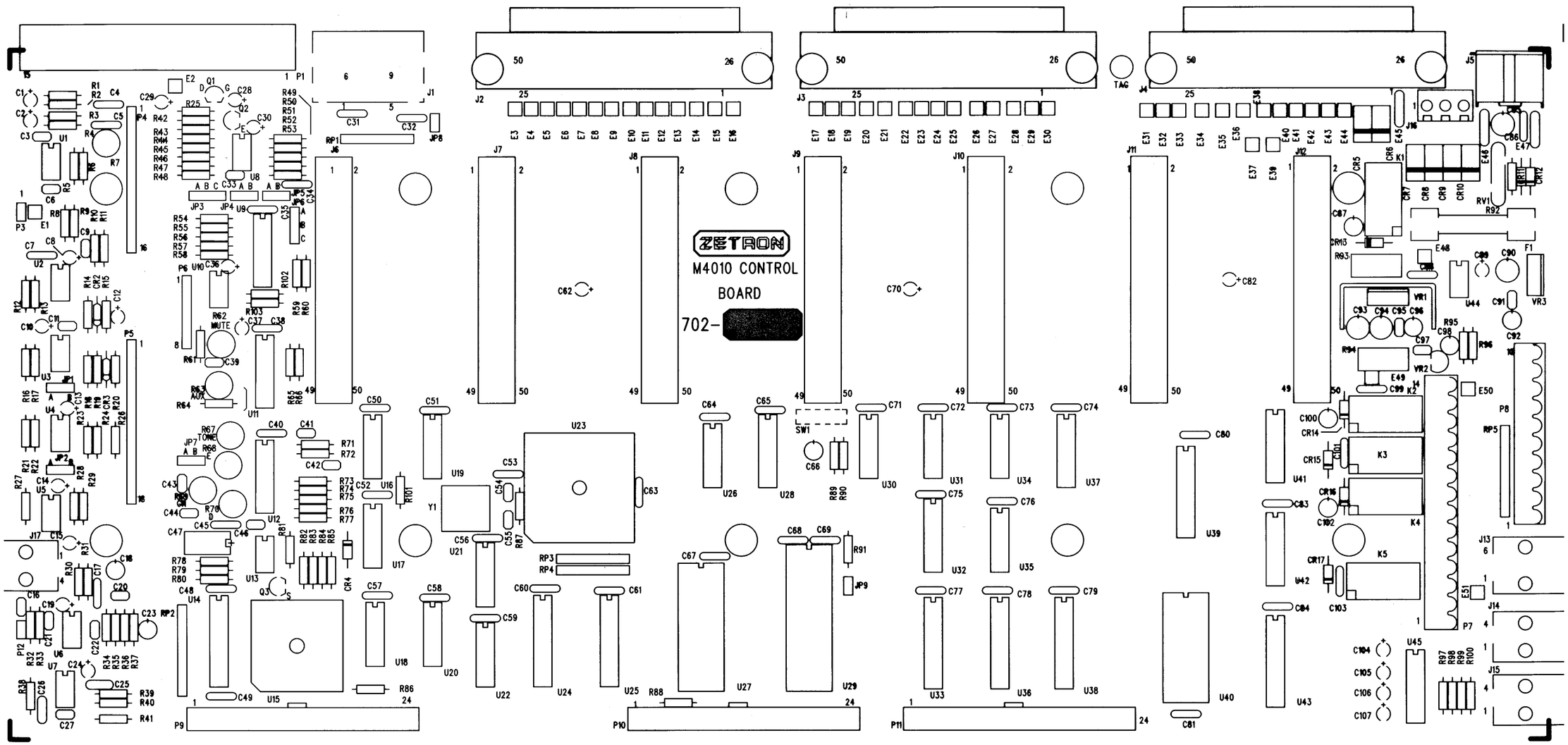
43	1	C25	152-0088	.0047UF 50V +-5%POLYESTER	ECQ-B1H472JZ
44	23	C1,C2,C8,C10,C12, C13,C14,C15,C19,C24, C28,C29,C30,C36,C37, C62,C70,C82,C89,C104, C105,C106,C107	154-0025	1 UF 35V TANTALUM	ECS-F-35E1
45	9	C18,C23,C66,C87,C92, C96,C98,C100,C102	155-0052	10 UF 35V +-20% RADIAL ALUM. ELECT.	ECEA1VU100
46	1	C47	155-0055	22 UF 25V +50%-10% AXIAL ALUM. ELECT.	TLBIE220M
47	4	C85,C90,C93,C94	155-0077	100UF 25V +-20% RADIALALUM. ELECT.	ECEA1EU101
48	48	E1,E2,E3,E4,E5,E6, E7,E8,E9,E10,E11,E12, E13,E14,E15,E16,E17, E18,E19,E20,E21,E22, E23,E24,E25,E26,E27, E28,E29,E30,E31,E32, E33,E34,E35,E36,E37, E38,E39,E40,E41,E42, E43,E44,E48,E49,E50,E51	305-0001	FERRITE BEADS W/ LEADS	11413-3B
49	3	E45,E46,E47	305-0306	EMI SUPPRESSION FILTER	DSS3055FZ103N
50	1	VR2	316-0005	REGULATOR 5V LOW POWER	LM78L05ACZ
51	1	U45	316-0232	RS232 DRIVER CMOS	ADM232LJN
52	9	U1,U2,U3,U4,U5,U6, U8,U10,U44	316-0353	DUAL OP-AMP, DUAL BIFET	LF353N
53	1	U7	316-0662	OP-AMP, CMOS, DUAL	LMC662CN
54	1	VR1	316-2940	REGULATOR, +5V, LOW DROPOUT	LM2940CT-5.0
55	1	U13	316-7705	POWER ON RESET	TL7705
56	1	VR3 **NOTE 3**	316-7805	REGULATOR, +5V 1.5A	LM340T-5.0
57	2	U16,U19	317-1489	QUAD RS-232 RECEIVER	MC1489A
58	0	U15^	321-6805	ASIC 008	
59	1	U23	321-6813	UP-HC, NON-MUX W/CS	MC68HC11F1
60	1	U40	321-6851	VART 2MHZ	MC68B50P
61	1	U27	321-8256	32K X 8 SRAM LP	HPD43256-15L
62	1	U12	323-4052	DUAL 4-CHAN ANALOG MUX	MC14052B
63	2	U9,U11	323-4053	3PDT SWITCH	MC144053
64	2	U21,U22	323-4906	HEX LEVEL SHIFT	MM74C906N
65	0	U29^	323-8256	32K X 8 FLASH EPROM	P28F256A-150
66	2	U17,U26	324-4125	TRI-STATE QUAD BUFFER	MM74HC125
67	3	U28,U32,U37	324-4138	DECODER 1 OF 8	MCH74HC138
68	1	U33	324-4373	OCTAL LATCH	MC74HC373
69	1	U20	324-4393	DUAL 4 BIT COUNTER	MC74HC393N
70	2	U31,U34	324-7400	QUAD NAND	MC74HC00N
71	1	U18	324-7408	QUAD 2 IN AND	MC74HC08AN
72	2	U30,U35	324-7414	HEX SCHMIDT	SN74HC14N
73	1	U43	325-4244	BUFFER,HCT,3-STATE,OCTAL,DIP-20	74HCT244
74	1	U38	325-4245	OCTAL XCVR	MC74HCT245AN
75	5	U14,U24,U25,U36,U39	325-4273	OCTAL DFF	MM74HCT273
76	1	Q1	340-0201	XSTR,JFET,N-CHANNEL,VGS > -1.5,TO-92	J201
77	2	U42,U41	340-2003	RELAY DRIVER 50V/.5A	ULN2003
78	1	Q2	340-3906	PNP 40V/200MA	2N3906
79	1	Q3	340-5460	JFETP-CHAN	2N5460
80	2	CR2,CR3	342-3009	SILICON .50 SP	1N4148
81	6	CR12,CR13,CR14,CR15, CR16,CR17	342-3011	SILICON 1A 1000V .50 SP	1N4007
82	6	CR5,CR6,CR7,CR8, CR9,CR10	342-5400	SIL 3A 50V .50 SP	1N5400
83	1	CR4	343-3029	1W 5.1V +-5% .50 SP	1N4733A
84	1	CR11	343-3108	1W 15V +-5% .50 SP	1N4744A
85	1	SW1 **NOTE 2**	371-0012	SPDT .1 CENTERS	MMS-12
86	1	Y1 **NOTE 1**	376-0800	8MHz XTAL HC-18	FOX080
87	5	K1,K2,K3,K4,K5	380-0030	DPDT 12V COIL MINI RELAY	G5V-2
88	1	J1	401-0664	DB9 S	DEP-9S-CA
89	1	P1	401-0059	15 POS R/A HEADER	6923.6
90	1	J16	401-0060	3-POS TERM BLK	2MV-03
91	7	J6,J7,J8,J9,J10, J11,J12	401-0063	50 PIN CARD EDGE	A8D25DS28C
92	2	J14,J15,J17#	401-0078	4 PIN TELCO MNT	520257-2
93	0	J13#	401-0080	6-PIN LO PRO R/A TELCO	520250-3
94	3	J2,J3,J4	401-0206	50 PIN RJ21 CONN MALE	552726-1
95	1	J5	401-0217	5 PIN DIN	WMPCBA
96	1	P7	401-1101	14 POS HEADER	1101.6
97	3	P9,P10,P11	401-2421	CONN, LOCKING HEADER, 24 POS	FPH-2421T
98	1	P8	401-3592	10-POS BLOCK MALE VERT	1105.6
99	4	P3,JP8,JP9,P12	403-0002	2 OF 401-0052	
100	5	JP1,JP2,JP4,JP5,JP7	403-0003	3 OF 401-0052	

101	2	JP3,JP6	403-0004	4 OF 401-0052	
102	1	P6	403-0008	8 OF 401-0052	
103	1	P4	403-0016	16 OF 401-0052	
104	1	P5	403-0018	18 OF 401-0052	
105	1	F1	416-6025	FUSE AGC 2.5ASB-LITTLEFUSE	MDL 2.5ASB
106	1	XVR1	210-0001	NUT,KEP, 4-40, S-ZN	
107	6	XJ2-4 **(2 EA)**	220-0106	SCREW,4-40 x 5/16,PAN,PHL,S-Zn	
108	2	XVR1,3	220-0108	SCREW,4-40 x 1/4,PAN,PHL,S-Zn	
109	1	XVR3 **NOTE 3**	234-0007	WASHER,SHOULDER,#4,FIBRE	
110	1	XVR3 **NOTE 3**	236-0001	INSULATOR,TO-220,MICA	
111	1	XVR3 **NOTE 3**	251-1239	WASHER,FLAT,#4,.250"OD/.120"ID/.032"THK,FIBRE	
112	1	XVR1	381-0003	HEATSINK,TO-220,SMALL STAMPING	
113	13	XJP1-7 **(POS A)**	402-3040	MINI JUMPER, .1 X .2 X .37"	
		XP4 **(PINS 1-2,3-4,5-6,7-8)**			
		XP5,6 **(PINS 1-2)**			
114	6	XU1, 3, 6, 8, 10, 44	407-0008	SKT, 08 PIN DIP	
115	2	XU16, 19	407-0014	SKT, 14 PIN DIP	
116	4	XU11, 41, 42, 45	407-0016	SKT, 16 PIN DIP	
117	2	XU39,43	407-0020	SKT, 20 PIN DIP	
118	1	XU40	407-0024	SKT, 24 PIN DIP	
119	1	XU27	407-0028	SKT, 28 PIN DIP	
120	1	XU29	407-0032	SKT, 32 PIN DIP	
121	1	XU15	407-0044	SKT, 44 PIN PLCC	
122	1	XU23	407-0068	SKT, 68 PIN PLCC	
123	1	PCB, BARE	410-9376C	M4010 CONTROL BRD.	
124	1	XVR3 **NOTE 3**	415-9597A	M4010 REGULATOR HEATSINK	
125	1	XU27	416-1217	28 PIN BATT/WATCH 8K/32K	DS1216C
126	2	XF1	416-3040	FUSE CLIP	

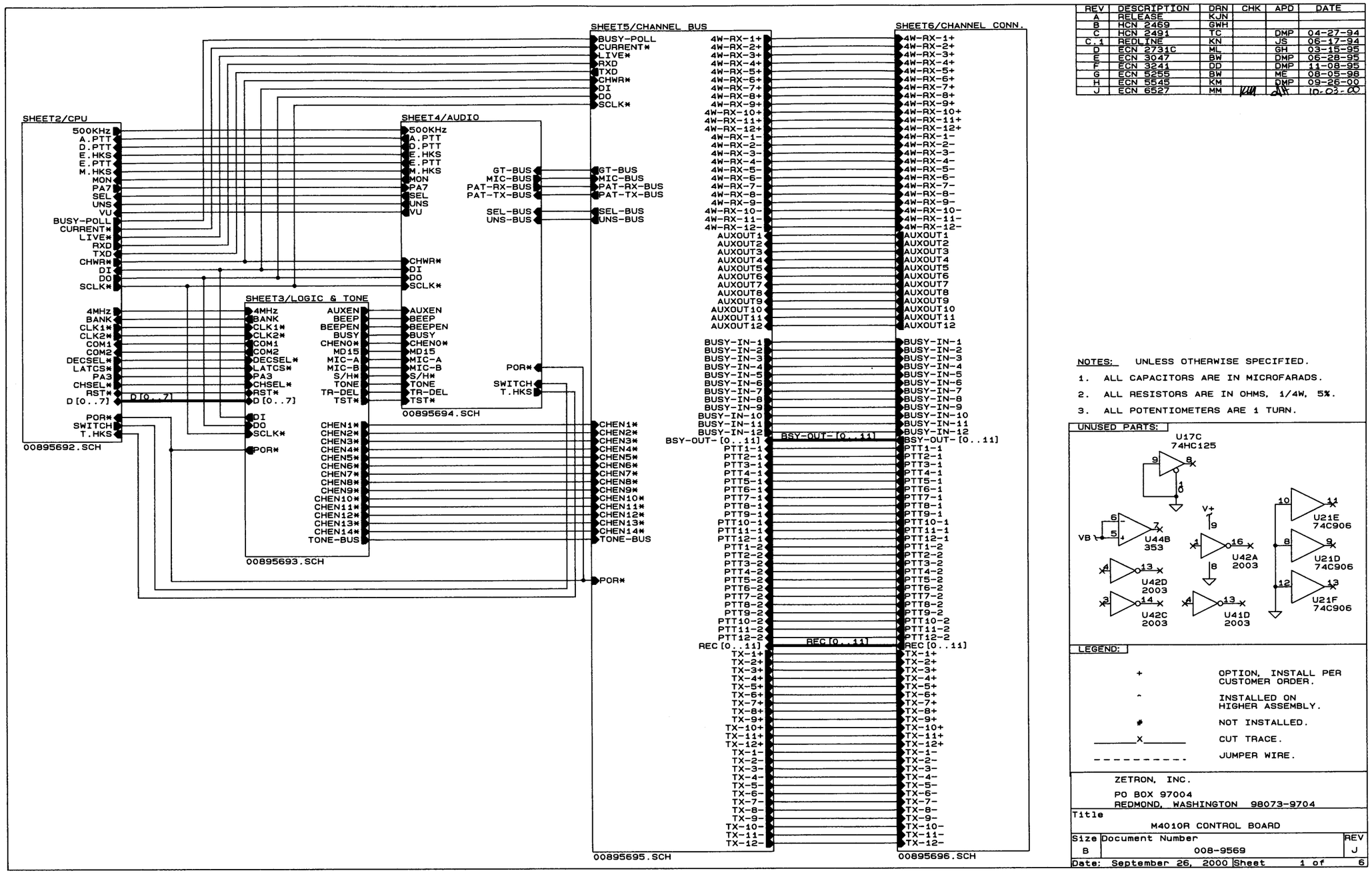
REFERENCE DESIGNATORS NOT USED: P2,CR1

NOTES: (Notes are for production use only.)

Control Board Silkscreen



Control Board Schematic (008-9569J)



REV	DESCRIPTION	DRN	CHK	APD	DATE
A	RELEASE	KJN			
B	HCN 2469	GWH			
C	HCN 2491	TC		DMP	04-27-94
C.1	REDLINE	KN		JS	06-17-94
D	ECN 2791C	ML		GH	03-15-95
E	ECN 3047	BW		DMP	06-28-95
F	ECN 3241	DD		DMP	11-08-95
G	ECN 5255	BW		ME	08-05-98
H	ECN 5545	KM		DMP	09-26-00
J	ECN 6527	MM			10-03-00

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL CAPACITORS ARE IN MICROFARADS.
2. ALL RESISTORS ARE IN OHMS, 1/4W, 5%.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

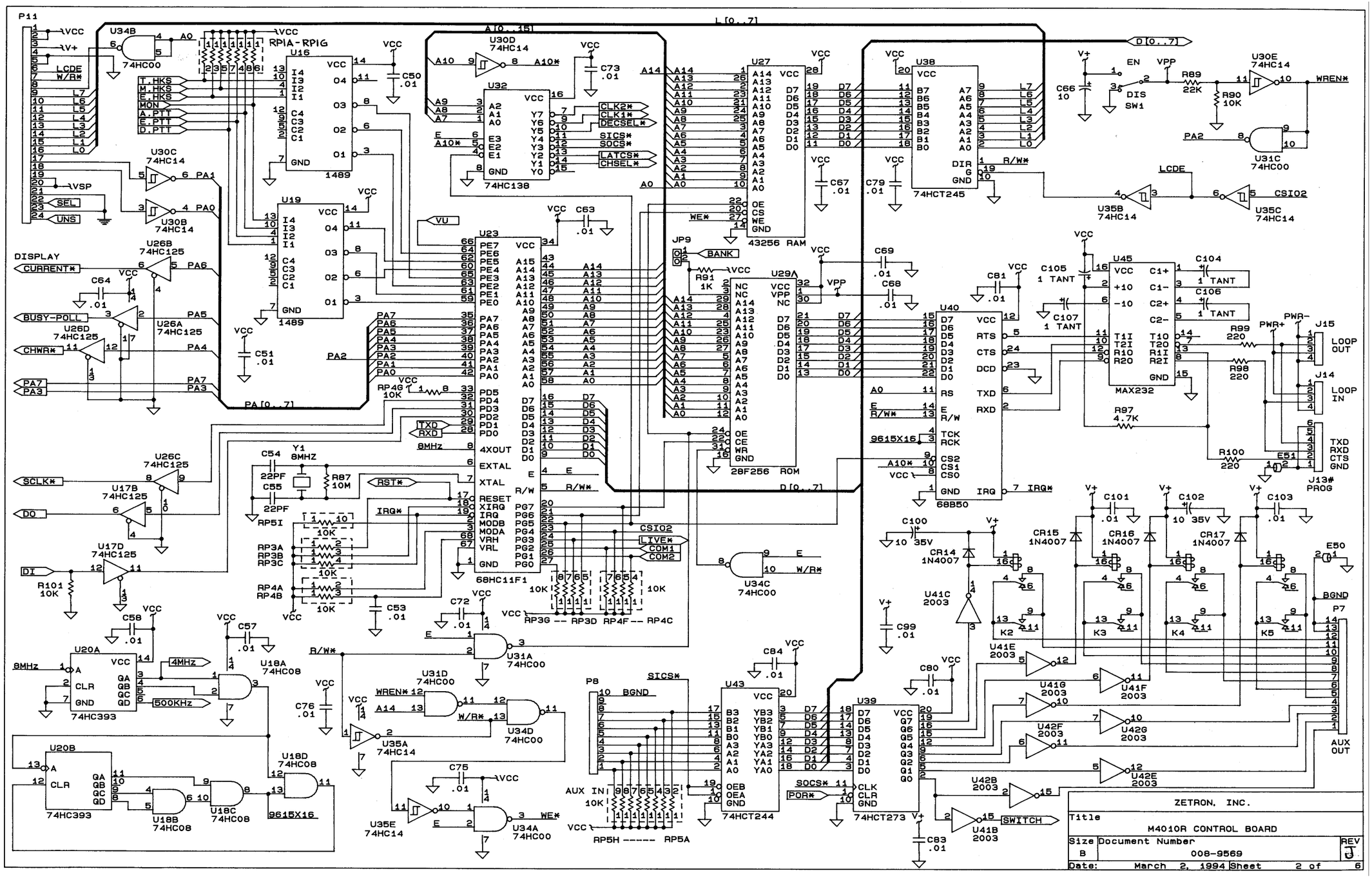
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
_____X_____	CUT TRACE.
- - - - - - - - - -	JUMPER WIRE.

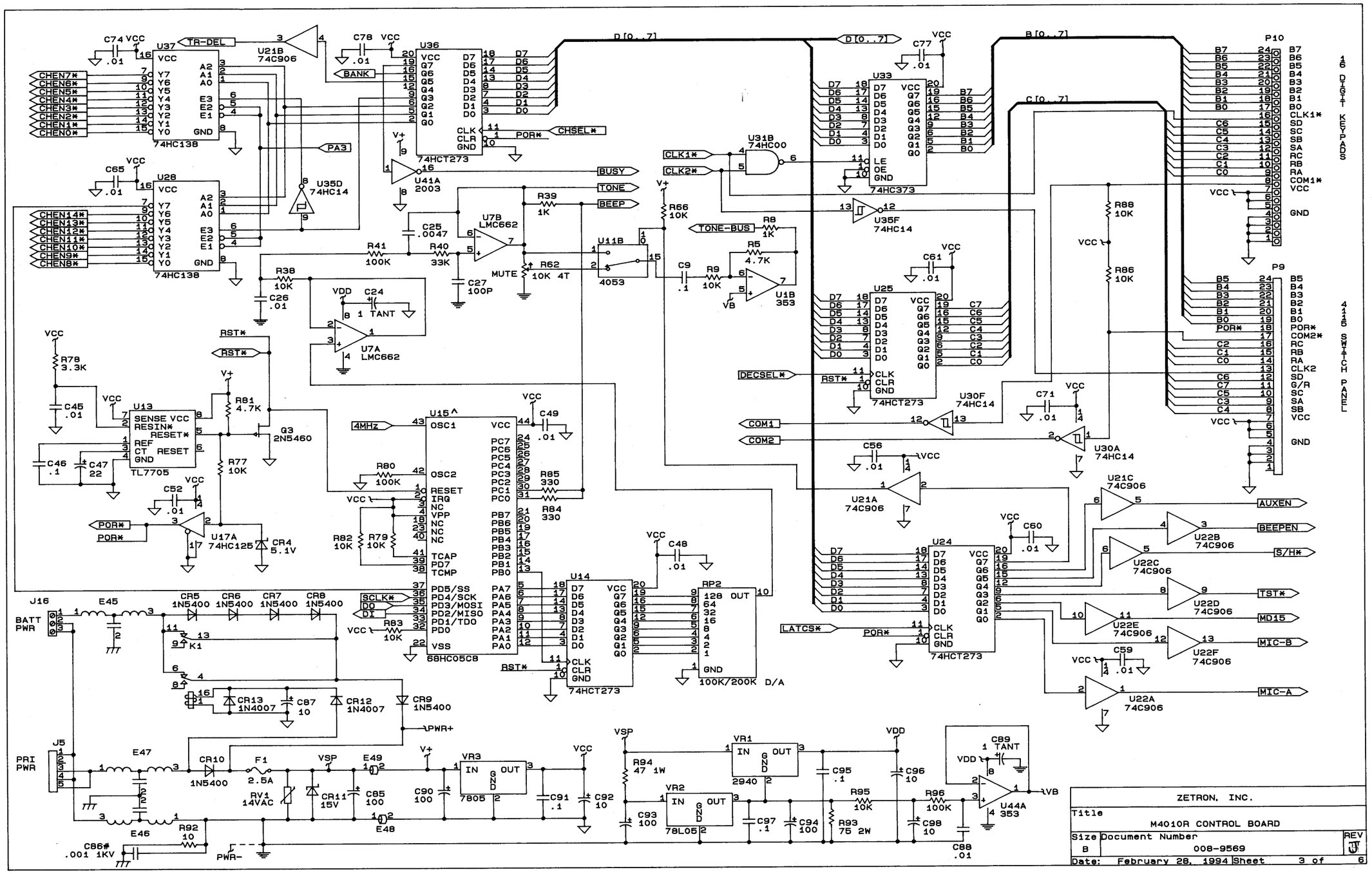
ZETRON, INC.
PO BOX 97004
REDMOND, WASHINGTON 98073-9704

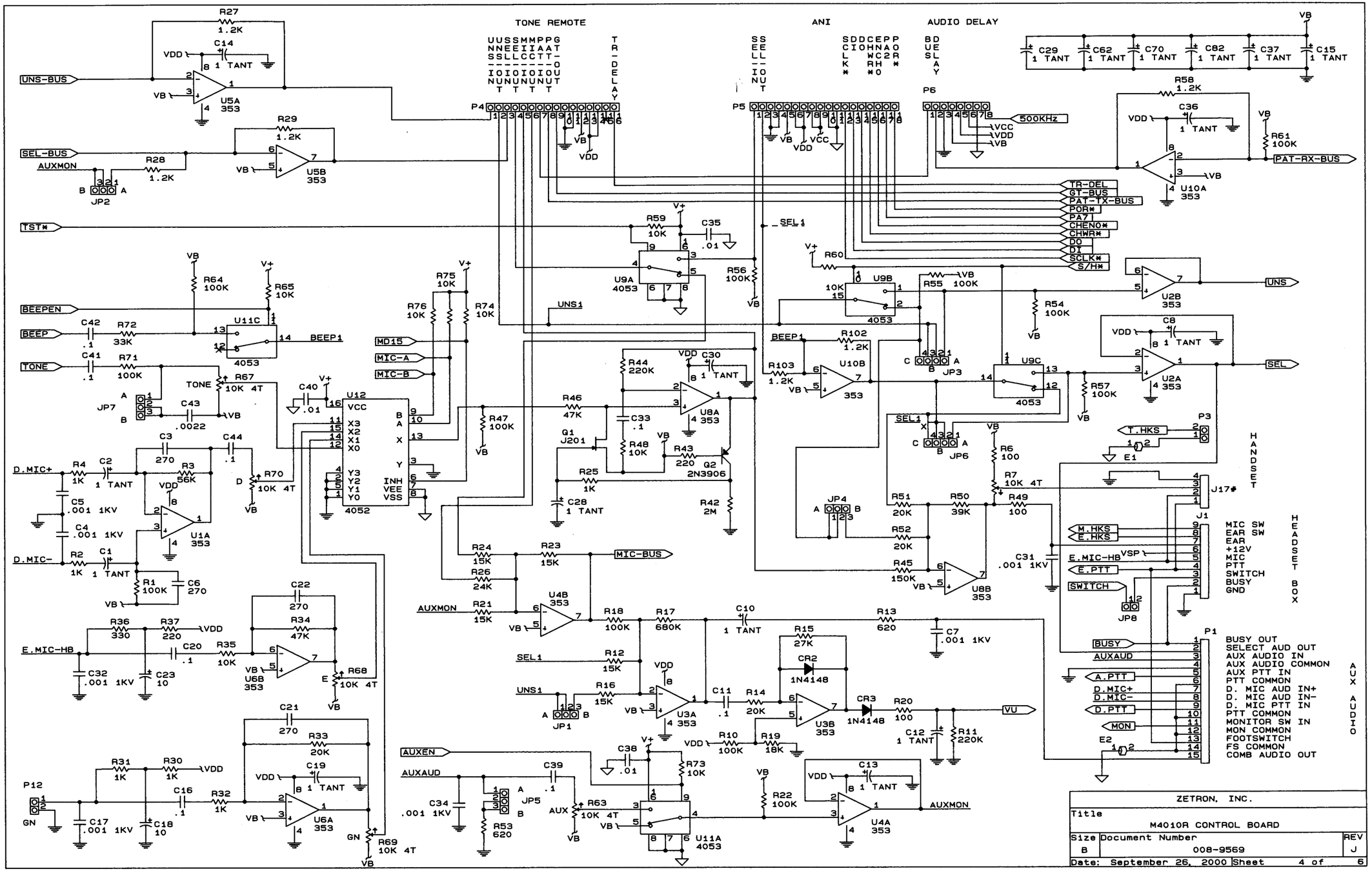
Title: M4010R CONTROL BOARD

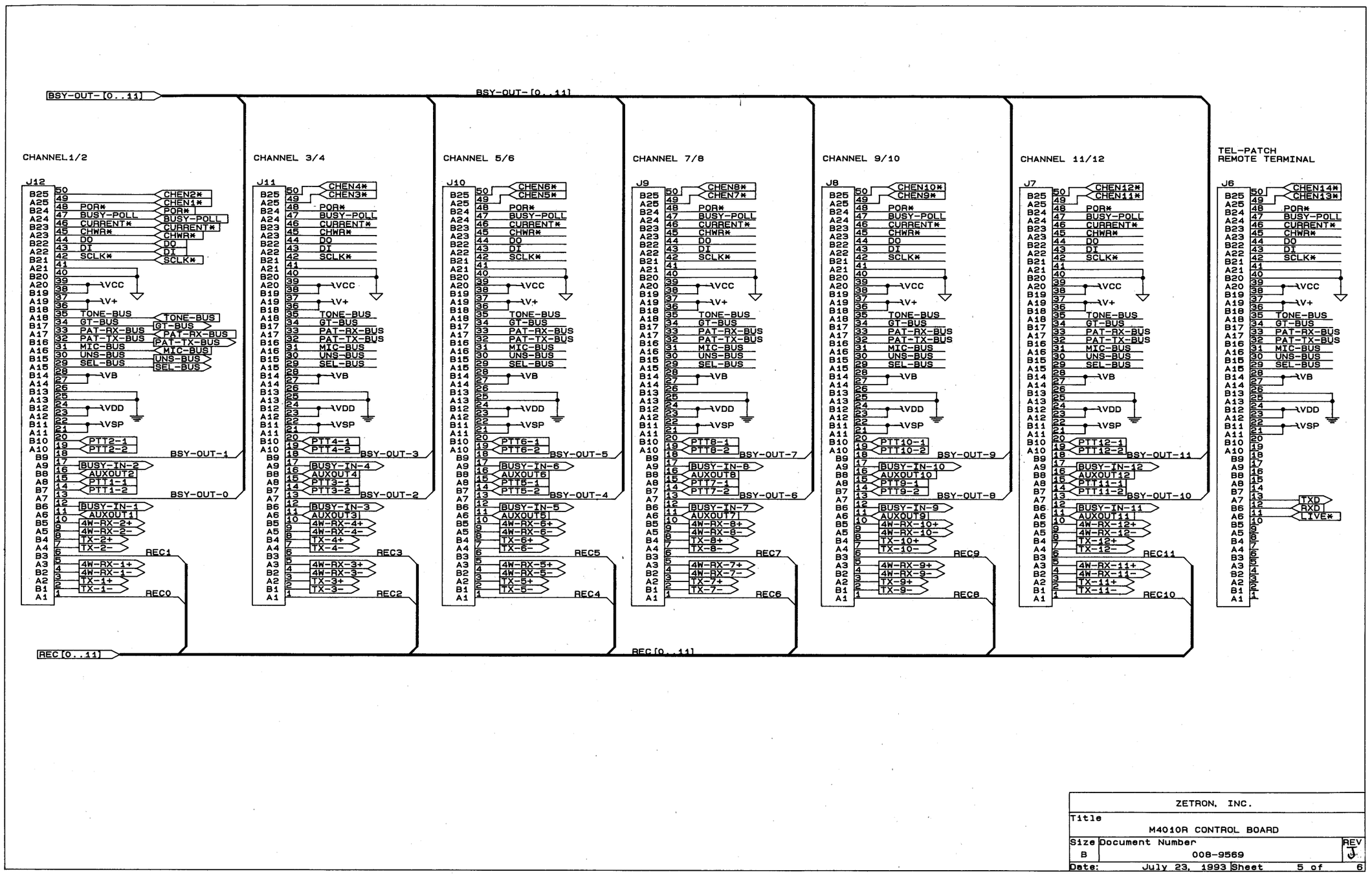
Size: B | Document Number: 008-9569 | REV: J

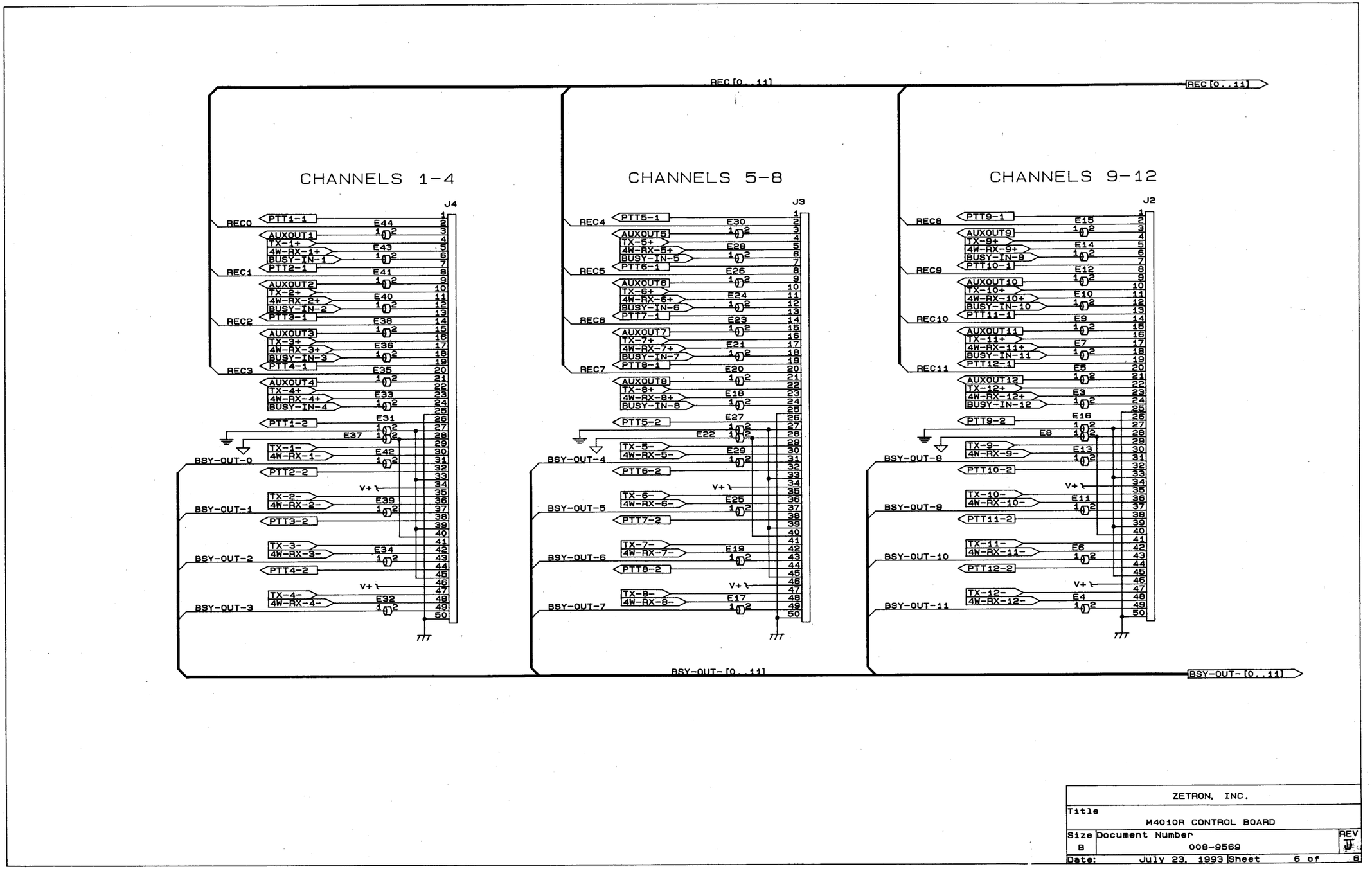
Date: September 26, 2000 | Sheet 1 of 6


ZETRON, INC.
Title
M4010R CONTROL BOARD
Size B
Document Number 008-9569
REV J
Date: March 2, 1994 Sheet 2 of 6
74HC00
74HC14
74HC125
74HC08
74HC393
74HC138
74HCT245
74HCT244
74HCT273
43256 RAM
28F256 ROM
68HC11F1
68B50
MAX232
9615X16
RP1A-RP1G
1489
2003
1N4007
LOOP OUT
LOOP IN
AUX OUT
TXD
RXD
CTS
GND
PROG
WREN*
CSI02
LIVE*
COM1
COM2
SICS*
SOCS*
LATCS*
CHSEL*
DECSEL*
CLK2*
CLK1*
RST*
IRQ*
SWITCH
BANK
BGND
VCC
V+
VPP


ZETRON, INC.
Title
M4010R CONTROL BOARD
Size B
Document Number 008-9569
REV J
Date: February 28, 1994 Sheet 3 of 6
16 DIGIT KEYPADS
4/5 SWITCH PANEL
P10
P9
D[0..7]
B[0..7]
C[0..7]
TR-DEL
BANK
PA3
CHSEL*
POR*
BUSY
TONE
BEEP
TONE-BUS
CLK1*
CLK2*
DECSEL*
LATCS*
COM1
COM2
RST*
SCLK*
DO
DI
4MHz
AUXEN
BEEPEN
S/H*
TST*
MD15
MIC-B
MIC-A
CHEN7*
CHEN6*
CHEN5*
CHEN4*
CHEN3*
CHEN2*
CHEN1*
CHEN0*
CHEN14*
CHEN13*
CHEN12*
CHEN11*
CHEN10*
CHEN9*
CHEN8*
U37 74HC138
U28 74HC138
U21B 74C906
U36 74HCT273
U41A 2003
U35D 74HC14
U31B 74HC00
U33 74HC373
U35F 74HC14
U25 74HCT273
U30F 74HC14
U30A 74HC14
U21C 74C906
U21A 74C906
U24 74HCT273
U22B 74C906
U22C 74C906
U22D 74C906
U22E 74C906
U22F 74C906
U22A 74C906
U7B LMC662
U7A LMC662
U11B 4053
U1B 353
U44A 353
U13 TL7705
U15 68HC05C8
U14 74HCT273
U17A 74HC125
RP2 128 OUT 64 32 16 8 4 2 1 100K/200K D/A
U18 74HC14
U35A 74HC14
U35B 74HC14
U35C 74HC14
U35E 74HC14
U35F 74HC14
U30B 74HC14
U30C 74HC14
U30D 74HC14
U30E 74HC14
U30F 74HC14
U30A 74HC14
VR1 2940
VR2 78L05
VR3 7805
J16 BATT PWR
J5 PRI PWR
K1
CR4 5.1V
CR5 1N5400
CR6 1N5400
CR7 1N5400
CR8 1N5400
CR9 1N5400
CR10 1N5400
CR12 1N4007
CR13 1N4007
F1 2.5A
RV1 14VAC
Q3 2N5460
PWR+
PWR-
VCC
VDD
VSP
VB
V+
GND
TANT


TONE REMOTE
ANI
AUDIO DELAY
UNS-BUS
SEL-BUS
AUXMON
TST*
BEEPEN
BEEP
TONE
D.MIC+
D.MIC-
E.MIC-HB
AUXEN
AUXAUD
MD15
MIC-A
MIC-B
MIC-BUS
UNS1
SEL1
BEEP1
TR-DEL
GT-BUS
PAT-TX-BUS
POR*
PA7
CHENO*
CHWR*
DO
DI
SCLK*
S/H*
PAT-RX-BUS
UNS
SEL
VU
AUXMON
500KHz
JP2
JP7
JP1
JP3
JP4
JP5
JP6
JP8
P1
P3
P4
P5
P6
P12
J1
J17*
E1
E2
T.HKS
M.HKS
E.HKS
E.MIC-HB
E.PTT
SWITCH
MIC SW
EAR SW
EAR
+12V
MIC
PTT
SWITCH
BUSY
GND
BUSY OUT
SELECT AUD OUT
AUX AUDIO IN
AUX AUDIO COMMON
AUX PTT IN
PTT COMMON
D. MIC AUD IN+
D. MIC AUD IN-
D. MIC PTT IN
PTT COMMON
MONITOR SW IN
MON COMMON
FOOTSWITCH
FS COMMON
COMB AUDIO OUT
HANDSET
HEADSET BOX
AUX AUDIO
ZETRON, INC.
Title
M4010R CONTROL BOARD
Size B
Document Number 008-9569
REV J
Date: September 26, 2000
Sheet 4 of 6


BSY-OUT-[0..11]
BSY-OUT-[0..11]
CHANNEL1/2
CHANNEL 3/4
CHANNEL 5/6
CHANNEL 7/8
CHANNEL 9/10
CHANNEL 11/12
TEL-PATCH
REMOTE TERMINAL
J12
J11
J10
J9
J8
J7
J6
CHEN2*
CHEN1*
CHEN4*
CHEN3*
CHEN6*
CHEN5*
CHEN8*
CHEN7*
CHEN10*
CHEN9*
CHEN12*
CHEN11*
CHEN14*
CHEN13*
POR*
BUSY-POLL
CURRENT*
CHWR*
DO
DI
SCLK*
VCC
V+
TONE-BUS
GT-BUS
PAT-RX-BUS
PAT-TX-BUS
MIC-BUS
UNS-BUS
SEL-BUS
VB
VDD
VSP
PTT2-1
PTT2-2
PTT4-1
PTT4-2
PTT6-1
PTT6-2
PTT8-1
PTT8-2
PTT10-1
PTT10-2
PTT12-1
PTT12-2
BSY-OUT-1
BSY-OUT-3
BSY-OUT-5
BSY-OUT-7
BSY-OUT-9
BSY-OUT-11
BUSY-IN-2
AUXOUT2
PTT1-1
PTT1-2
BUSY-IN-4
AUXOUT4
PTT3-1
PTT3-2
BUSY-IN-6
AUXOUT6
PTT5-1
PTT5-2
BUSY-IN-8
AUXOUT8
PTT7-1
PTT7-2
BUSY-IN-10
AUXOUT10
PTT9-1
PTT9-2
BUSY-IN-12
AUXOUT12
PTT11-1
PTT11-2
BSY-OUT-0
BSY-OUT-2
BSY-OUT-4
BSY-OUT-6
BSY-OUT-8
BSY-OUT-10
BUSY-IN-1
AUXOUT1
BUSY-IN-3
AUXOUT3
BUSY-IN-5
AUXOUT5
BUSY-IN-7
AUXOUT7
BUSY-IN-9
AUXOUT9
BUSY-IN-11
AUXOUT11
4W-RX-2+
4W-RX-2-
TX-2+
TX-2-
4W-RX-4+
4W-RX-4-
TX-4+
TX-4-
4W-RX-6+
4W-RX-6-
TX-6+
TX-6-
4W-RX-8+
4W-RX-8-
TX-8+
TX-8-
4W-RX-10+
4W-RX-10-
TX-10+
TX-10-
4W-RX-12+
4W-RX-12-
TX-12+
TX-12-
4W-RX-1+
4W-RX-1-
TX-1+
TX-1-
4W-RX-3+
4W-RX-3-
TX-3+
TX-3-
4W-RX-5+
4W-RX-5-
TX-5+
TX-5-
4W-RX-7+
4W-RX-7-
TX-7+
TX-7-
4W-RX-9+
4W-RX-9-
TX-9+
TX-9-
4W-RX-11+
4W-RX-11-
TX-11+
TX-11-
REC0
REC1
REC2
REC3
REC4
REC5
REC6
REC7
REC8
REC9
REC10
REC11
TXD
RXD
LIVE*
REC[0..11]
REC[0..11]
ZETRON, INC.
Title
M4010R CONTROL BOARD
Size
B
Document Number
008-9569
REV
J
Date:
July 23, 1993
Sheet
5 of
6


REC[0..11]
REC[0..11]
CHANNELS 1-4
CHANNELS 5-8
CHANNELS 9-12
J4
J3
J2
REC0
REC1
REC2
REC3
REC4
REC5
REC6
REC7
REC8
REC9
REC10
REC11
PTT1-1
AUXOUT1
TX-1+
4W-RX-1+
BUSY-IN-1
PTT2-1
AUXOUT2
TX-2+
4W-RX-2+
BUSY-IN-2
PTT3-1
AUXOUT3
TX-3+
4W-RX-3+
BUSY-IN-3
PTT4-1
AUXOUT4
TX-4+
4W-RX-4+
BUSY-IN-4
PTT1-2
TX-1-
4W-RX-1-
PTT2-2
TX-2-
4W-RX-2-
PTT3-2
TX-3-
4W-RX-3-
PTT4-2
TX-4-
4W-RX-4-
V+
E44
E43
E41
E40
E38
E36
E35
E33
E31
E37
E42
E39
E34
E32
BSY-OUT-0
BSY-OUT-1
BSY-OUT-2
BSY-OUT-3
PTT5-1
AUXOUT5
TX-5+
4W-RX-5+
BUSY-IN-5
PTT6-1
AUXOUT6
TX-6+
4W-RX-6+
BUSY-IN-6
PTT7-1
AUXOUT7
TX-7+
4W-RX-7+
BUSY-IN-7
PTT8-1
AUXOUT8
TX-8+
4W-RX-8+
BUSY-IN-8
PTT5-2
TX-5-
4W-RX-5-
PTT6-2
TX-6-
4W-RX-6-
PTT7-2
TX-7-
4W-RX-7-
PTT8-2
TX-8-
4W-RX-8-
E30
E28
E26
E24
E23
E21
E20
E18
E27
E22
E29
E25
E19
E17
BSY-OUT-4
BSY-OUT-5
BSY-OUT-6
BSY-OUT-7
PTT9-1
AUXOUT9
TX-9+
4W-RX-9+
BUSY-IN-9
PTT10-1
AUXOUT10
TX-10+
4W-RX-10+
BUSY-IN-10
PTT11-1
AUXOUT11
TX-11+
4W-RX-11+
BUSY-IN-11
PTT12-1
AUXOUT12
TX-12+
4W-RX-12+
BUSY-IN-12
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TX-9-
4W-RX-9-
PTT10-2
TX-10-
4W-RX-10-
PTT11-2
TX-11-
4W-RX-11-
PTT12-2
TX-12-
4W-RX-12-
E15
E14
E12
E10
E9
E7
E5
E3
E16
E8
E13
E11
E6
E4
BSY-OUT-8
BSY-OUT-9
BSY-OUT-10
BSY-OUT-11
BSY-OUT-[0..11]
BSY-OUT-[0..11]
ZETRON, INC.
Title
M4010R CONTROL BOARD
Size
B
Document Number
008-9569
REV
D
Date:
July 23, 1993
Sheet
6 of
6

Display/Keyboard Parts List (702-9570D.5)

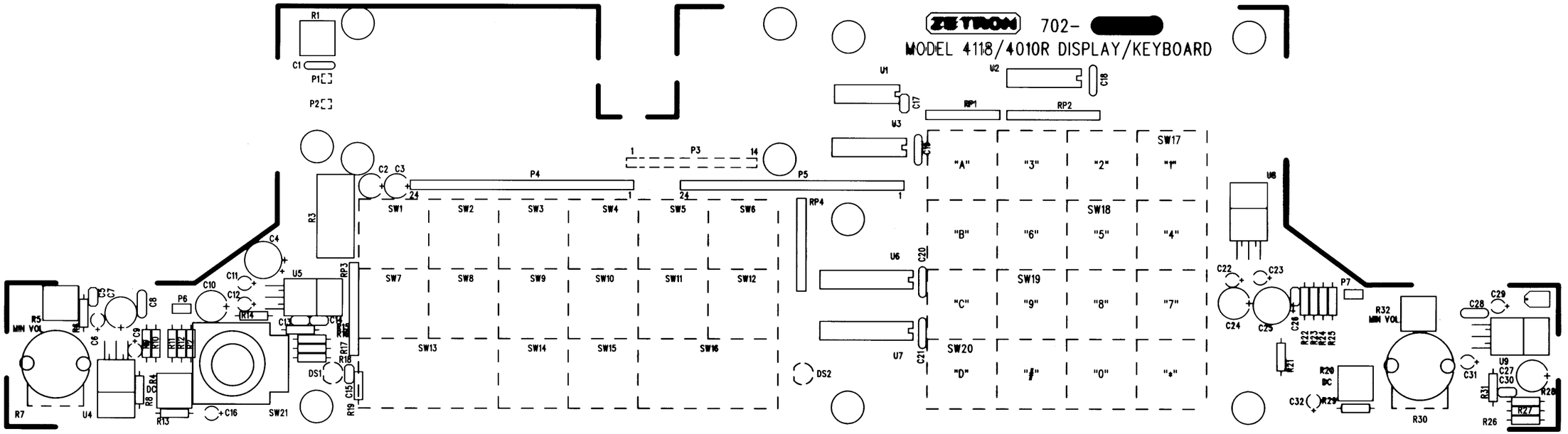
LEGEND:
+ = OPTION, INSTALL PER CUSTOMER ORDER
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
= = SUBSTITUTE PART

ZETRON M4010R DISPLAY/KEYBOARD BOARD PARTS LIST:

Item	Qty	Reference	Part No.	Description	Part Value
1	4	R6,R15,R22,R28	101-0010	RESISTOR,1.0 OHM,1/4W,5%,CARBON FILM	1.0
2	4	R10,R11,R24,R26	101-0013	RESISTOR,2.2 OHM,1/4W,5%,CARBON FILM	2.2
3	6	R9,R12,R14,R23, R25,R27	101-0057	RESISTOR,220 OHM,1/4W,5%,CARBON FILM	220
4	2	R8,R31	101-0073	RESISTOR,1.0K OHM,1/4W,5%,CARBON FILM	1.0K
5	2	R18,R16	101-0085	RESISTOR,3.3K OHM,1/4W,5%,CARBON FILM	3.3K
6	2	R19,R17	101-0113	RESISTOR,47K OHM,1/4W,5%,CARBON FILM	47K
7	2	R13,R29	101-0115	RESISTOR,56K OHM,1/4W,5%,CARBON FILM	56K
8	2	R2,R21	101-0145	RESISTOR,1.0M OHM,1/4W,5%,CARBON FILM	1.0M
9	1	R3	103-0275	RESISTOR, 75 OHM,5W,5%,WIREWOUND,FLAMEPROOF	75 5W
10	2	R7,R30	107-0002	POT,10K OHM,ROTORY,LINEAR TAPER	10K
11	2	R5,R32	107-0202	POT,2K OHM,1 TURN	2K
12	2	R4,R20	107-0504	POT,200K OHM,1 TURN	200K
13	1	R1	107-3085	POT,10K OHM,1 TURN	10K
14	1	RP1	119-0007	R-NETWORK,100K OHM x 7,BUSSED,SIP-08	100K
15	2	RP3,RP4	119-0011	R-NETWORK,220 OHM x 9,BUSSED,SIP-10	220
16	1	RP2	119-0015	R-NETWORK,100K OHM x 9,BUSSED,SIP-10	100K
17	5	C1,C18,C19,C20,C21	150-0110	CAP,.01uF,50V,80%-20%,CERAMIC DISC	.01
18	3	C14,C15,C17	151-0120	CAP,.01uF,50V,10%,CERAMIC X7R	.01
19	4	C5,C13,C26,C30	151-0181	CAP,.1uF,50V,10%,CERAMIC X7R	.1
20	2	C8,C28	152-0085	CAP,.01uF,50V,5%,POLYESTER	.01
21	2	C29,C9	154-0025	CAP,1uF,35V,10%,TANTALUM	1 TANT
22	8	C6,C11,C12,C16,C22, C23,C31,C32	154-0100	CAP,10uF,16V,10%,TANTALUM	10 TANT
23	1	C3,C2#	155-0077	CAP,100uF,25V,20%,RADIAL,Al-E	100
24	4	C7,C10,C24,C27	155-0083	CAP,470uF,10V,20%,RADIAL,Al-E	470 10V
25	2	C25,C4	155-0084	CAP,470uF,25V,20%,RADIAL,Al-E	470 25V
26	2	DS2,DS1 **NOTE 4**	311-0022	LED,RED,DIFFUSED,T-1	
27	4	U4,U5,U8,U9	316-2003	AMP,AUDIO,8W,HORIZ MOUNT,TO-200-5	LM383
28	1	U2	323-4051	MUX/DEMUX,ANALOG,1-TO-8,DIP-16	4051
29	1	U3	323-4052	MUX,ANALOG,4 CHANNEL,DUAL,DIP-16	4052
30	2	U6,U7	324-4374	FLIP-FLOP,D,HC,3-STATE,NON-INVERTING,OCTAL	74HC374
31	1	U1	324-7414	INVERTER,SCHMITT,MOTOROLA THRESHOLDS,HEX	74HC14
32	1	SW21	371-0015	ENCODER,ROTARY,1/4" SHAFT	
33	2	P4,P5	401-2421	CONN,HDR,LOCKING,24POS	
34	0	P1#,P2# **NOTE 1**	403-0001	01 OF 401-0052	
35	1	P3	403-0014	14 OF 401-0052	
36	2	P7,P6	404-1002	02 OF 401-1364	
37	4	LCD DISPLAY	210-0001	NUT,KEP,4-40,S-Zn	
38	48	XSW1-16 **(2 EA)** XSW17-20 **(4 EA)**	220-0075	SCREW,SELF TAP,#3x5/16,TYPE 25,PAN,PHL,S-Zn	
39	4	LCD DISPLAY	220-0102	SCREW,4-40 x 3/8, PAN PHL,S-Zn	
40	4	LCD DISPLAY	251-1250	SPACER,RND,#4 x .125",3/16"OD,NYLON	
41	2	XDS1,2	251-3125	SPACER,RND,#4 x 5/16",.250"OD,FIBRE	
42	1	XP3 **NOTES 1-3**	311-1623	LCD,16 x 2,LARGE-STN	
43	14	SW1-12,14,15 **NOTE 4**	311-4222	LED,RED,TRANSPARENT,T-1	
44	16	SW1-16 **NOTE 4**	373-1100	CT 1 X 1 LED/KEY HOUSING	
45	4	SW17-20 **NOTE 4**	373-1101	CT 1 X 4 LED/KEY HOUSING	
46	32	SW1-16 **(1 EA) NOTE 4** SW17-20 **(4 EA) NOTE 4**	373-1102	CT KEY PLUNGER	
47	32	SW1-16 **(1 EA) NOTE 4** SW 17-20 **(4 EA) NOTE 4**	373-1103	CT 1 X 1 KEYPAD ELASTOMER	
48	1	XP1,2 **NOTE 1**	408-2401	WIRE,24AWG(19/36),600V,105C,PVC,BLACK	
49	1	PCB	410-9354C	M4118/4010R DISPLAY/KEYBOARD	

NOTES: (Notes are for production use only.)

Display/Keyboard Silkscreen



Display/Keyboard Schematic (008-9570D)

REV	DESCRIPTION	DRN	CHK	APVD	DATE
A	RELEASE	KM			
B	HCN 2382	DW			
C	HCN 2468	TC			3-9-94
D	ECN 3241	DD			11-8-95

SHEET 2 OF 3

DISPLAY

00895702.SCH

SHEET 3 OF 3

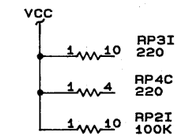
KEYPAD

00895703.SCH

NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, 5%;
2. ALL CAPACITOR VALUES ARE IN MICROFARADS;
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

⏚	ANALOG GROUND.
⏚	CHASSIS GROUND.
⏚	DIGITAL GROUND.
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
——X——	CUT TRACE.
- - - - - - - -	JUMPER WIRE.

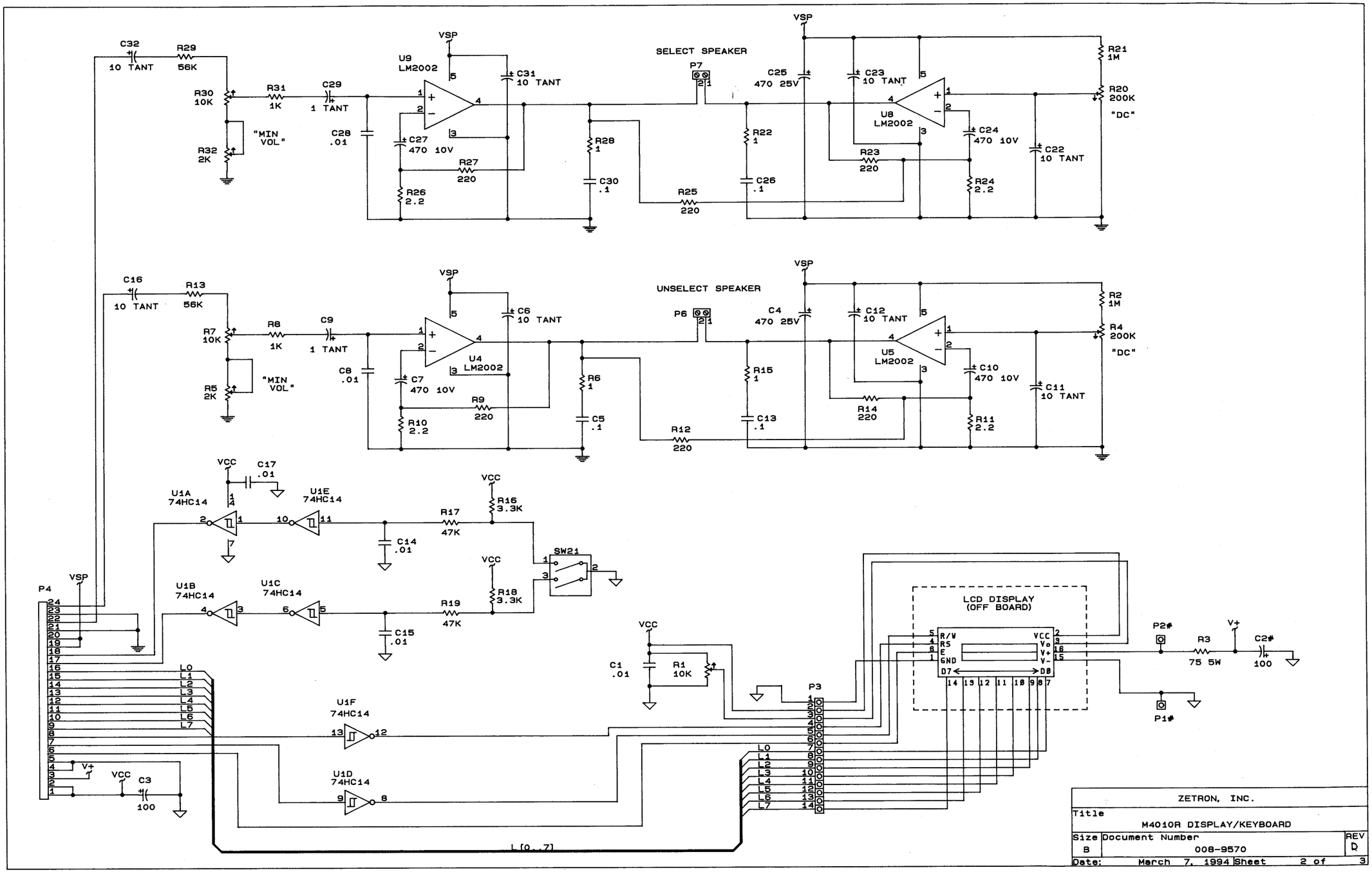
ZETRON INCORPORATED

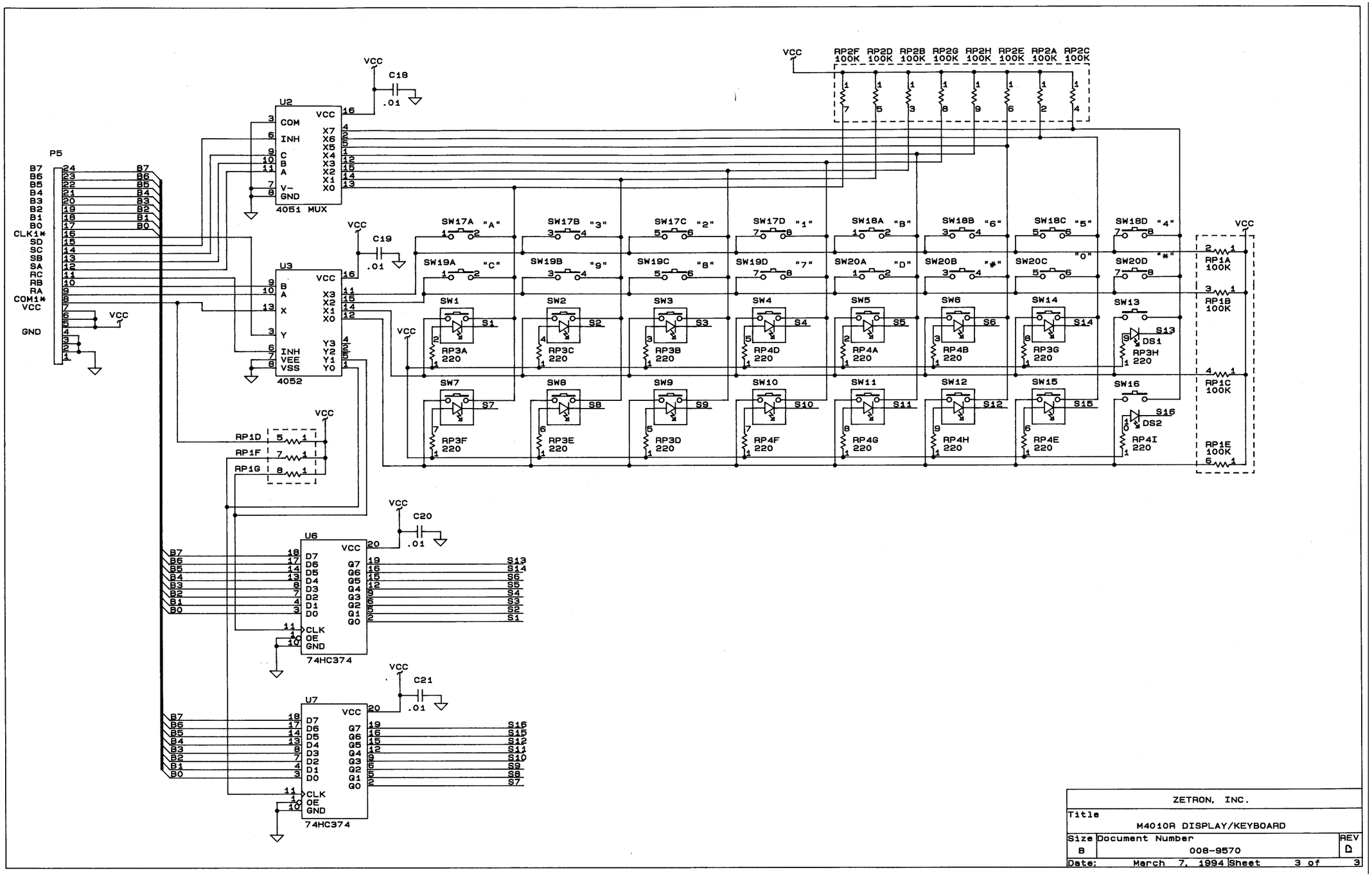
12335 134TH COURT NORTHEAST
REDMOND, WASHINGTON 98052-2433

Title: M4010R DISPLAY/KEYBOARD

Size	Document Number	REV
B	008-9570	D

Date: March 8, 1994 Sheet 1 of 3


C32
10 TANT
R29
56K
R30
10K
R31
1K
C29
1 TANT
R32
2K
"MIN VOL"
C28
.01
U9
LM2002
VSP
C31
10 TANT
C27
470 10V
R27
220
R26
2.2
R28
1
C30
.1
SELECT SPEAKER
P7
C25
470 25V
R22
1
C26
.1
R25
220
U8
LM2002
C23
10 TANT
R23
220
C24
470 10V
R24
2.2
C22
10 TANT
R21
1M
R20
200K
"DC"
C16
10 TANT
R13
56K
R7
10K
R8
1K
C9
1 TANT
R5
2K
"MIN VOL"
C8
.01
U4
LM2002
C7
470 10V
R9
220
R10
2.2
C6
10 TANT
R6
1
C5
.1
UNSELECT SPEAKER
P6
C4
470 25V
R15
1
C13
.1
R12
220
U5
LM2002
C12
10 TANT
R14
220
C10
470 10V
R11
2.2
C11
10 TANT
R2
1M
R4
200K
"DC"
VCC
C17
.01
U1A
74HC14
U1E
74HC14
R17
47K
C14
.01
R16
3.3K
SW21
U1B
74HC14
U1C
74HC14
R19
47K
C15
.01
R18
3.3K
P4
VSP
V+
C3
100
U1F
74HC14
U1D
74HC14
L0
L1
L2
L3
L4
L5
L6
L7
L[0..7]
C1
.01
R1
10K
P3
LCD DISPLAY
(OFF BOARD)
R/W
RS
E
GND
VCC
Vo
V+
V-
D7
D0
P2#
P1#
R3
75 5W
C2#
100
ZETRON, INC.
Title
M4010R DISPLAY/KEYBOARD
Size
B
Document Number
008-9570
REV
D
Date: March 7, 1994
Sheet 2 of 3



ZETRON, INC.		
Title: M4010R DISPLAY/KEYBOARD		
Size: B	Document Number: 008-9570	REV: D
Date: March 7, 1994	Sheet 3 of 3	

60-Button Interface Parts List (702-9572D)

LEGEND:

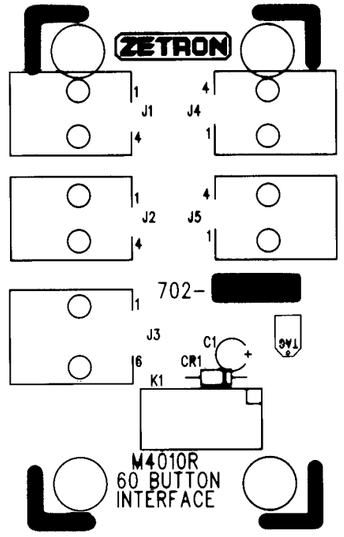
\# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
\+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON MODEL 4010R 60 BUTTON INTERFACE PARTS LIST (702-9572D)

Item	Qty	Reference	Part No.	Description	Part Value
1	1	C1	155-0052	10 UF 35V +-20% RADIAL ALUM. ELEC.	ECE-B2AV100S
2	1	CR1	342-3011	SILICON 1A 1000V .50 SP	1N4007
3	1	K1	380-0030	DPDT 12V COIL MINI RELAY	G5V-2
4	1	J3	401-0080	6-PIN LO PRO R/A TELCO	520250-3
5	4	J1,J2,J4,J5	401-5202	4 PIN TELCO, RT ANGLE	520249-2
6	1	PCB	410-9572B	PCB, M4010R 60 BUTTON INTERFACE	

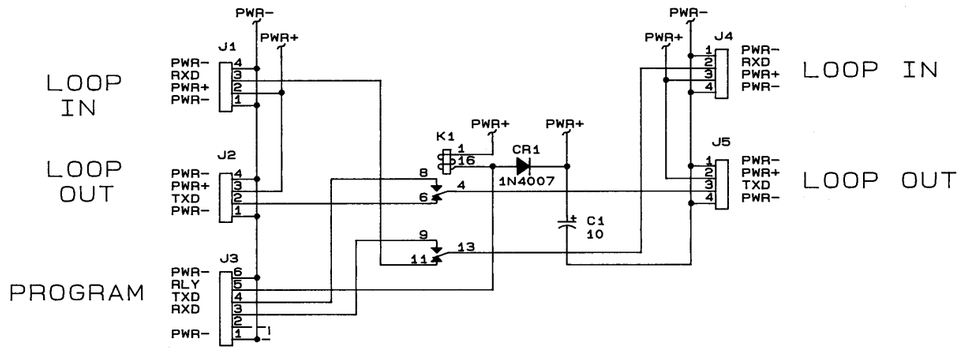
NOTES: (Notes are for production use only.)

60-Button Interface Silkscreen



60-Button Interface Schematic (008-9572D)

REV.	DESCRIPTION	DRN.	APVD.	DATE
A	RELEASE	GH		
B	HCN 2415	GH		
C	HCN 2493	TC		
D	ECN 2807A	ML	DMP	4-4-95



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS +/- 5% AND ARE 1/4 WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

⏚	ANALOG GROUND
⏚	CHASSIS GROUND
⏚	DIGITAL GROUND
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
——— X ———	CUT TRACE.
- - - - - - - - - - -	JUMPER WIRE.

ZETRON INCORPORATED
12335 134TH COURT NORTHEAST
REDMOND, WASHINGTON 98052-2433

Title: M4010R 60 BUTTON INTERFACE BOARD

Size	Document Number	REV
B	008-9572	D

Date: April 4, 1995 Sheet 1 of 1

MODEL 4011 BOARDS

30-Button Board Parts List (702-9711A)

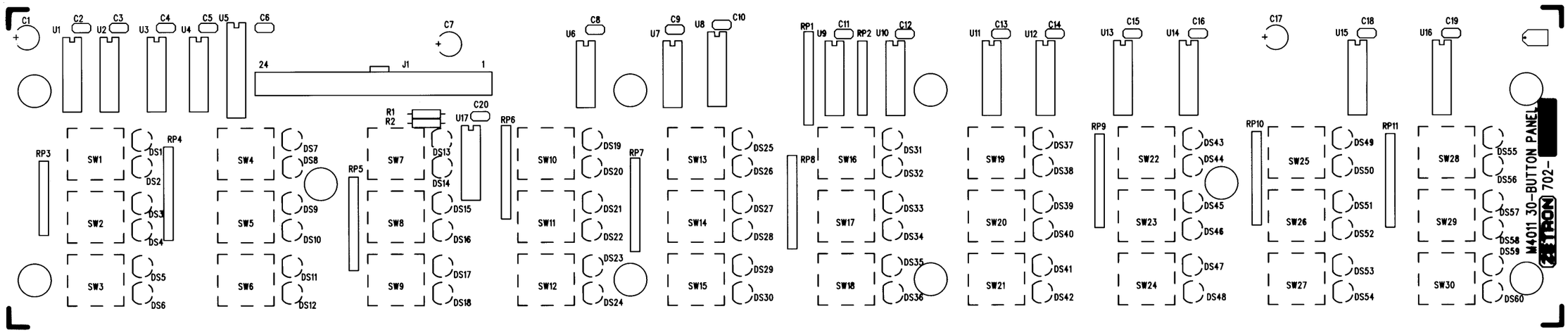
LEGEND:
= NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON MODEL 4011 30-BUTTON PANEL PARTS LIST (702-9711A)

Item	Qty	Reference	Part No.	Description	Part Value
1	1	R1	101-0097	10K 1/4W 5% CARBON FILM	
2	1	R2	101-0121	100K 1/4W 5% CARBON FILM	
3	2	RP1,RP6	119-0006	10K x 9 BUSSED 10-PIN SIP	
4	2	RP2,RP3	119-0007	100K x7 BUSSED 8-PIN SIP	
5	7	RP4,RP5,RP7,RP8, RP9,RP10,RP11	119-0027	470 x 9 BUSSED 10-PIN SIP	
6	17	C2,C3,C4,C5,C6,C8, C9,C10,C11,C12,C13, C14,C15,C16,C18,C19,C20	151-0120	.01UF 50V/100V +-10% CERAMIC X7R	
7	3	C1,C7,C17	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
8	30	DS1,DS3,DS5,DS7, DS9,DS11,DS13,DS15, DS17,DS19,DS21,DS23, DS25,DS27,DS29,DS31, DS33,DS35,DS37,DS39, DS41,DS43,DS45,DS47, DS49,DS51,DS53,DS55, DS57,DS59 NOTE 3	311-0021	LED GREEN, T-1	
9	30	DS2,DS4,DS6,DS8, DS10,DS12,DS14,DS16, DS18,DS20,DS22,DS24, DS26,DS28,DS30,DS32, DS34,DS36,DS38,DS40, DS42,DS44,DS46,DS48, DS50,DS52,DS54,DS56, DS58,DS60, NOTE 3	311-0022	LED RED, T-1	
10	4	U8,U9,U10,U17	323-4051	1-TO-8 ANALOG MUX/DEMUX	4051
11	1	U6	324-4002	QUAD 2 INPUT NOR	74HC02
12	1	U5	324-4240	OCTAL BUFFER (INVERTING)	74HC240
13	1	U7	324-7400	QUAD NAND	74HC00
14	10	U1,U2,U3,U4,U11, U12,U13,U14,U15,U16	325-4174	HEX D. F/F	74HCT174
15	30	SW1,SW2,SW3,SW4, SW5,SW6,SW7,SW8,SW9, SW10,SW11,SW12,SW13, SW14,SW15,SW16,SW17, SW18,SW19,SW20,SW21, SW22,SW23,SW24,SW25, SW26,SW27,SW28,SW29, SW30 NOTE 3	371-0003	SINGLE KEY - NO LIGHT	
16	1	J1	404-2024	24 OF 401-0180	
17	2	XU6,7	407-0014	SKT, 14 PIN DIP	
18	14	XU1-4,8-18	407-0016	SKT, 16 PIN DIP	
19	1	XU5	407-0020	SKT, 20 PIN DIP	
20	1	PCB	410-9711A	M4011 30-BUTTON PANEL	
21	5	XDS1-60	415-9536	LED SPACER	

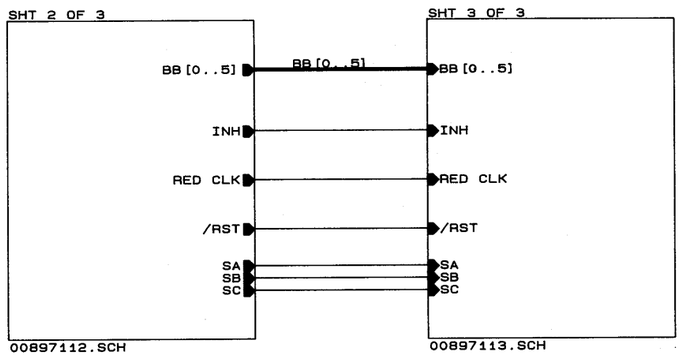
NOTES: (Notes are for production use only)

30-Button Board Silkscreen



30-Button Board Schematic (008-9711A)

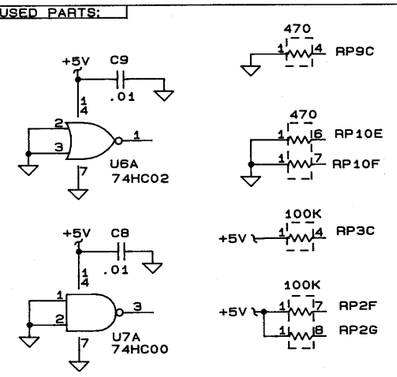
REV	DESCRIPTION	DRN	CHK	APVD	DATE
A	RELEASE	KM		MMD	3-14-95



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, 5%;
2. ALL CAPACITOR VALUES ARE IN MICROFARADS;
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:



LEGEND:

⏚	ANALOG GROUND
⏚	CHASSIS GROUND
⏚	DIGITAL GROUND
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
——— X ———	CUT TRACE.
- - - - - - - - - -	JUMPER WIRE.

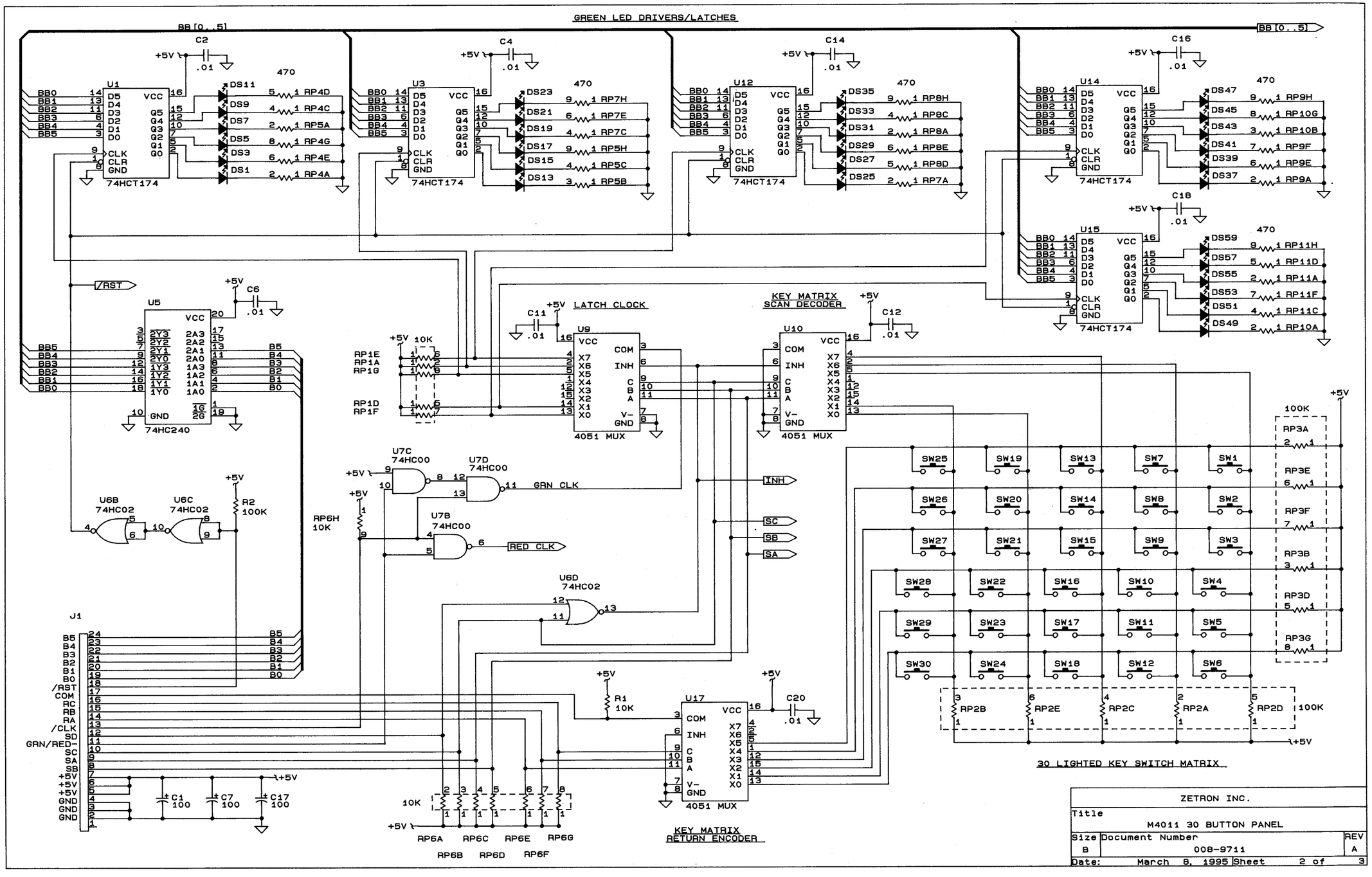
ZETRON INCORPORATED

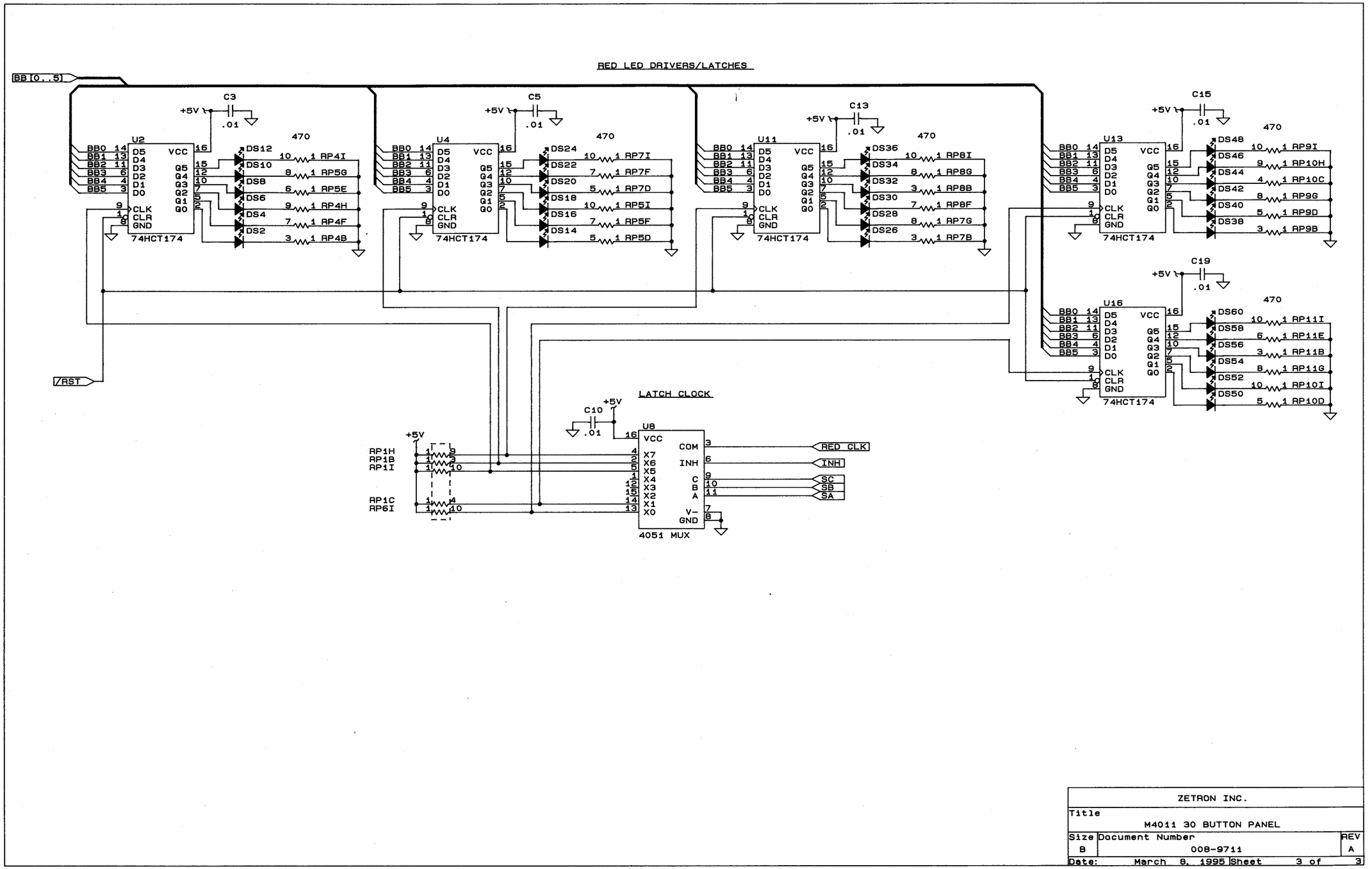
12335 134TH COURT NORTHEAST
REDMOND, WASHINGTON 98052-2433

Title: M4011 30 BUTTON PANEL

Size	Document Number	REV
B	008-9711	A

Date: March 8, 1995 Sheet 1 of 3


GREEN LED DRIVERS/LATCHES
BB[0..5]
BB[0..5]
U1
U3
U12
U14
U15
74HCT174
470
C2
C4
C14
C16
C18
.01
+5V
DS11
DS9
DS7
DS5
DS3
DS1
DS23
DS21
DS19
DS17
DS15
DS13
DS35
DS33
DS31
DS29
DS27
DS25
DS47
DS45
DS43
DS41
DS39
DS37
DS59
DS57
DS55
DS53
DS51
DS49
RP4D
RP4C
RP5A
RP4G
RP4E
RP4A
RP7H
RP7E
RP7C
RP5H
RP5C
RP5B
RP8H
RP8C
RP8A
RP8E
RP8D
RP7A
RP9H
RP10G
RP10B
RP9F
RP9E
RP9A
RP11H
RP11D
RP11A
RP11F
RP11C
RP10A
/RST
U5
74HC240
C6
LATCH CLOCK
U9
4051 MUX
C11
KEY MATRIX
SCAN DECODER
U10
C12
10K
RP1E
RP1A
RP1G
RP1D
RP1F
U7C
74HC00
U7D
74HC00
GRN CLK
U6B
74HC02
U6C
74HC02
R2
100K
RP6H
10K
U7B
74HC00
RED CLK
U6D
74HC02
INH
SC
SB
SA
100K
RP3A
RP3E
RP3F
RP3B
RP3D
RP3G
SW25
SW19
SW13
SW7
SW1
SW26
SW20
SW14
SW8
SW2
SW27
SW21
SW15
SW9
SW3
SW28
SW22
SW16
SW10
SW4
SW29
SW23
SW17
SW11
SW5
SW30
SW24
SW18
SW12
SW6
RP2B
RP2E
RP2C
RP2A
RP2D
30 LIGHTED KEY SWITCH MATRIX
J1
/RST
COM
RC
RB
RA
/CLK
SD
GRN/RED-
SC
SA
SB
C1
C7
C17
100
R1
10K
U17
C20
10K
RP6A
RP6C
RP6E
RP6G
RP6B
RP6D
RP6F
KEY MATRIX
RETURN ENCODER
ZETRON INC.
Title
M4011 30 BUTTON PANEL
Size
B
Document Number
008-9711
REV
A
Date: March 8, 1995
Sheet 2 of 3



ZETRON INC.		
Title: M4011 30 BUTTON PANEL		
Size: B	Document Number: 008-9711	REV: A
Date: March 6, 1995	Sheet 3 of 3	

Controller Board Parts List (702-9712A)

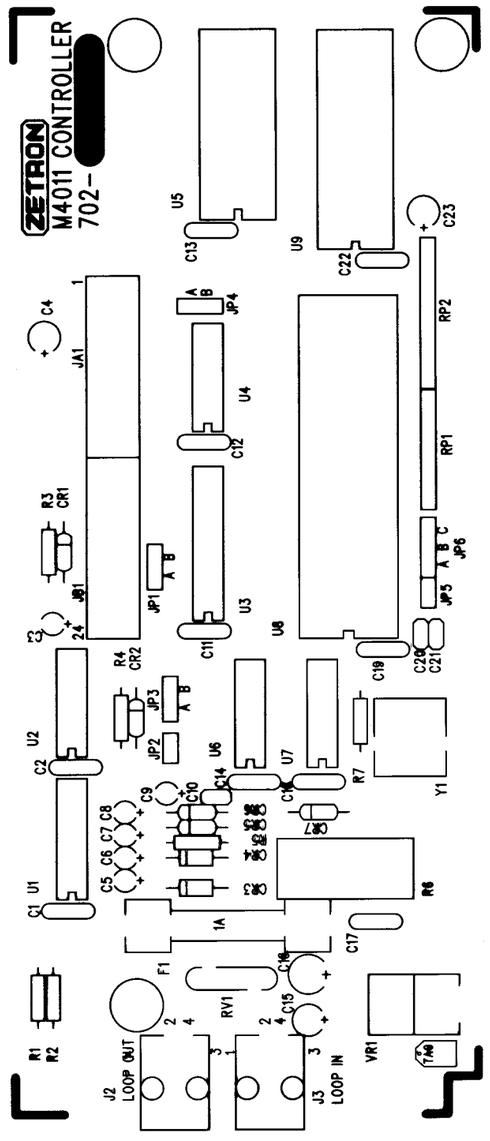
LEGEND:
= NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON MODEL 4011 CONTROLLER BOARD PARTS LIST (702-9712A)

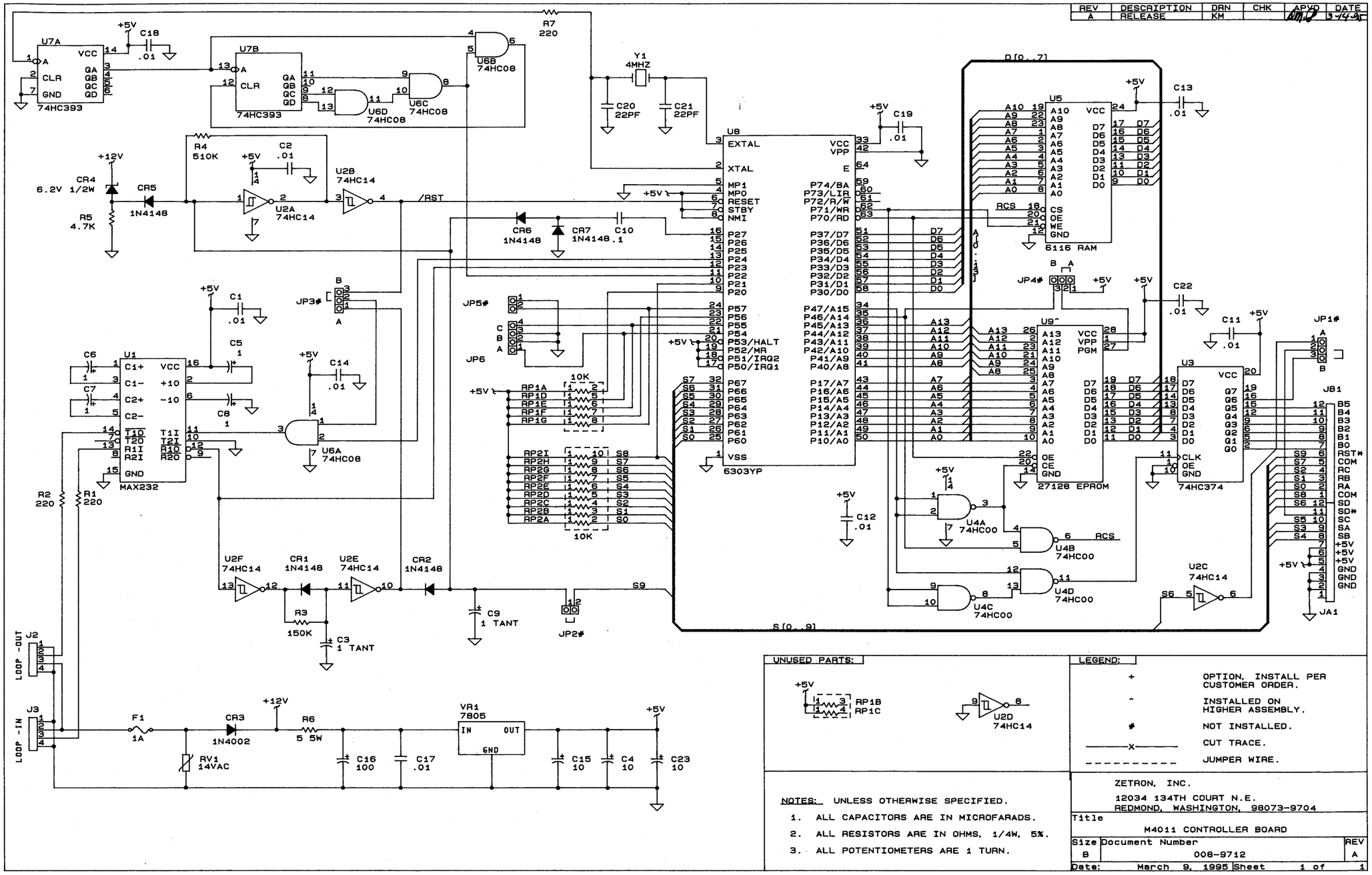
Item	Qty	Reference	Part No.	Description	Part Value
1	3	R1,R2,R7	101-0057	220 OHM 1/4W 5% CARBON FILM	
2	1	R5	101-0089	4.7K 1/4W 5% CARBON FILM	
3	1	R3	101-0125	150K 1/4W 5% CARBON FILM	
4	1	R4	101-0138	510K 1/4W 5% CARBON FILM	
5	1	R6 **NOTE 2**	103-3050	RES, 5 OHM 5W 5% WIREWOUND	
6	1	RV1	105-0002	VARISTOR 14V AC	
7	1	RP2	119-0006	10K x 9 BUSSED 10-PIN SIP	
8	1	RP1	119-0008	10K x 7 BUSSED 8-PIN SIP	
9	10	C1,C2,C11,C12,C13, C14,C17,C18,C19,C22	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	
10	2	C20,C21	151-0022	22PF 100V/200V +-10%/5% CERAMIC NPO	
11	1	C10	151-0180	.1UF 50V +-20% CERAMIC Z5U	
12	6	C3,C5,C6,C7,C8,C9	154-0025	1 UF 35V TANTALUM +- 10%	
13	3	C4,C15,C23	155-0052	10 UF 35V +-20% RADIAL ALUMINUM ELECTROLYTIC	
14	1	C16	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	
15	1	U1	316-0232	RS232 DRIVER CMOS +5V POWER	232
16	1	VR1	316-7805	REGULATOR, +5V 1.5A	7805
17	1	U5	321-6116	RAM 2Kx8 (450NS)	6116 RAM
18	1	U8	321-6303	MICROPROCESSOR CMOS	6303YP
19	0	U9^	322-7128	16K X 8 CMOS PROM, 250NS	27128 EPROM
20	1	U3	324-4374	OCTAL DFF REG	74HC374
21	1	U7	324-4393	DUAL 4 BIT COUNTER	74HC393
22	1	U4	324-7400	QUAD NAND	74HC00
23	1	U6	324-7408	QUAD 2 IN AND	74HC08
24	1	U2	324-7414	HEX SCHMIDT	74HC14
25	1	CR3	342-0001	SILICON 1A 100V .50 SP	1N4002
26	5	CR1,CR2,CR5,CR6,CR7	342-3009	SILICON .50 SP	1N4148
27	1	CR4	343-3017	1/2W 6.2V 5%	1N5234B
28	1	Y1 **NOTE 1**	376-0004	4.000 MHz HC 18 CASE	4MHz
29	2	JA1,JB1	401-0009	12-POS THRU PCB	
30	2	J2,J3	401-0078	4 PIN TELCO MNT	
31	0	JP2#,JP5#	403-0002	2 OF 401-0052	
32	0	JP1#,JP3#,JP4#	403-0003	3 OF 401-0052	
33	1	JP6	403-0004	4 OF 401-0052	
34	1	F1	416-1576	FUSE AGC 1 A FAST-BLOW	1A
35	1	XJP6 (POS B)	402-3040	MINI JUMPER	
36	4	XU2,4,6,7	407-0014	SKT, 14 PIN DIP	
37	1	XU1	407-0016	SKT, 16 PIN DIP	
38	1	XU3	407-0020	SKT, 20 PIN DIP	
39	1	XU5	407-0024	SKT, 24 PIN DIP	
40	1	XU9	407-0028	SKT, 28 PIN DIP	
41	1	XU8	407-0064	SKT, 64 PIN DIP	
42	4	XJP1,3 (POS B) XJP2,4 (POS A)	408-0001	WIRE JUMPER	
43	1	PCB	410-9712A	M4011 CONTROLLER BOARD	
44	2	XF1	416-3040	FUSE CLIPS	

NOTES: (Notes are for production use only)

Controller Board Silkscreen



Controller Board Schematic (008-9712A)



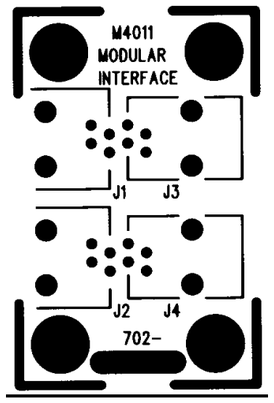
Modular Interface Board Parts List (702-9737A)

```
LEGEND:
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ZETRON M4011 MODULAR ITERFACE BOARD  PARTS LIST (702-9737A)
```

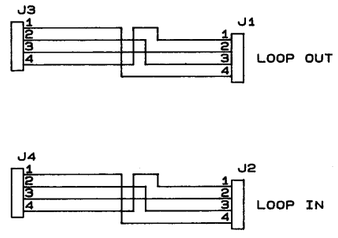
Item	Qty	Reference	Part No.	Description	Part Value
1	2	J4,J3		401-0078 4 PIN TELCO MNT	
2	2	J1,J2		401-5202 4 PIN TELCO, RT ANGLE	
3	1	PCB		410-9737A PCB, M4011 MODULAR INTERFACE BOARD	

Modular Interface Board Silkscreen



Modular Interface Board Schematic (008-9737A)

REV.	DESCRIPTION	DRN.	APVD.	DATE
A	RELEASE	DGW	[illegible]	11-14-94



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS +/- 5% AND ARE 1/4 WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. ALL POTENTIOMETERS ARE 1 TURN.

UNUSED PARTS:

LEGEND:

⏚	ANALOG GROUND
⏚	CHASSIS GROUND
⏚	DIGITAL GROUND
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
——— × ———	CUT TRACE.
- - - - - - - - - - -	JUMPER WIRE.

ZETRON INCORPORATED

12034 134TH COURT NORTHEAST
REDMOND, WASHINGTON 98073-9704

Title: M4011 MODULAR INTERFACE BOARD

Size	Document Number	REV
B	008-9737	A

Date: November 8, 1994 Sheet 1 of 1

MODEL 4115B BOARDS

Keyboard Parts List (702-9323A.2)

LEGEND:

= NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY
+ = OPTION (INSTALLED PER CUSTOMER ORDER)

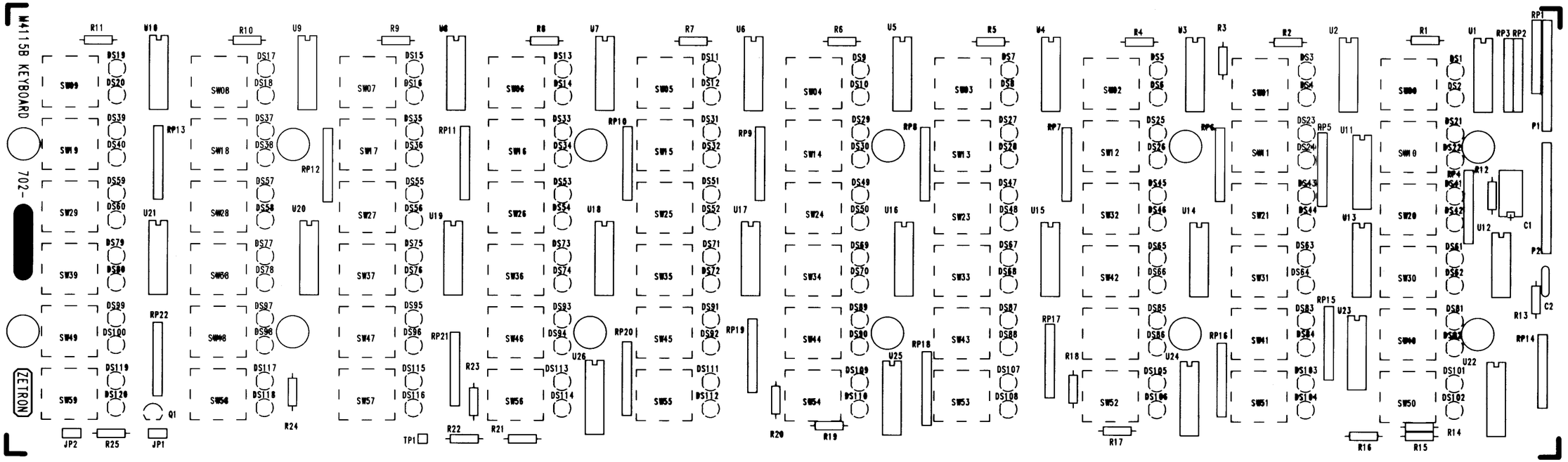
ZETRON MODEL 4115B KEYBOARD PARTS LIST (702-9323A.2)

Item	Qty	Reference	Part No.	Description	Part Value
1	15	R1,R2,R4,R5,R6,R7, R8,R9,R10,R11,R14,R18, R20,R23,R24	101-0057	220 OHM 1/4W 5% CARBON FILM	
2	1	R22,R25#	101-0085	3.3K 1/4W 5% CARBON FILM	
3	4	R12,R15,R19,R21	101-0097	10K 1/4W 5% CARBON FILM	
4	4	R3,R13,R16,R17	101-0121	100K 1/4W 5% CARBON FILM	
5	2	RP3,RP16	119-0007	100K X 7 R-SIP	4608-101-104
6	5	RP1,RP2,RP14,RP18, RP20	119-0008	10K X 7 R-SIP	
7	15	RP4,RP5,RP6,RP7, RP8,RP9,RP10,RP11,RP12, RP13,RP15,RP17,RP19, RP21,RP22	119-0022	220K X 7 R-SIP	750-81-R220
8	1	C2	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	DF-103Z
9	1	C1	155-0055	22 UF 25V +50%-10% AXIAL ALUM. ELECT.	TLBIE220M
10	60	DS1,DS3,DS5,DS7,DS9, DS11,DS13,DS15,DS17, DS19,DS21,DS23,DS25, DS27,DS29,DS31,DS33, DS35,DS37,DS39,DS41, DS43,DS45,DS47,DS49, DS51,DS53,DS57,DS59, DS61,DS63,DS65,DS67, DS69,DS71,DS73,DS75, DS77,DS79,DS81,DS83, DS85,DS87,DS89,DS91, DS93,DS95,DS97,DS99, DS101,DS103,DS105,DS107, DS109,DS111,DS113,DS115, DS117,DS119 NOTE 1	311-0021	LED GREEN, T-1	LTL-4231
11	60	DS2,DS4,DS6,DS8,DS10 DS12,DS14,DS16,DS18, DS20,DS22,DS24,DS26, DS28,DS30,DS32,DS34, DS36,DS38,DS40,DS42, DS44,DS46,DS48,DS50, DS52,DS54,DS56,DS58, DS60,DS62,DS64,DS66, DS68,DS70,DS72,DS74, DS76,DS78,DS80,DS82, DS84,DS86,DS88,DS90, DS92,DS94,DS96,DS98, DS100,DS102,DS104,DS106, DS108,DS110,DS112,DS114, DS116,DS118,DS120 NOTE 1	311-0022	LED RED, T-1	LTL-4221
12	1	U12	314-7400	QUAD NAND	74LS00
13	4	U1,U24,U25,U26	323-4051	1-TO-8 ANALOG MUX/DEMUX	MC14051B
14	1	U22	323-4053	3PDT SWITCH	MC144053
15	20	U2,U3,U4,U5,U6,U7, U8,U9,U10,U11,U13,U14, U15,U16,U17,U18,U19, U20,U21,U23	325-4174	HEX D. F/F	KS74HCT1174
16	0	Q1#	340-3904	NPN 40V/200MA	2N3904
17	60	SW01,SW02,SW03, SW04,SW05,SW06,SWO7, SW08,SW09,SW10,SW11, SW12,SW13,SW14,SW15, SW16,SW17,SW18,SW19, SW20,SW21,SW22,SW23, SW24,SW25,SW26,SW27,	371-0003	SINGLE KEY-NO LIGHT	JM2005#01

		SW28,SW29,SW30,SW31,		
		SW32,SW33,SW34,SW35,		
		SW36,SW37,SW38,SW39,		
		SW40,SW41,SW42,SW43,		
		SW44,SW45,SW46,SW47,		
		SW48,SW49,SW50,SW51,		
		SW52,SW53,SW54,SW55,		
		SW56,SW57,SW58,SW59,		
		SW00 NOTE 1		
18	1	TP1	403-0001	1 OF 401-0052
19	2	P1,P2 NOTE 2	403-2012	12 OF 401-0178
20	2	JP1,JP2	408-0001	WIRE JUMPER (24GA WIRE .35)
21	4		220-0108	440 X 1/4 SCREW
22	10		250-0104	440 X 1/2 STANDOFF
23	2		251-1240	440 X 1/16 SPACER
24	1	XU2	407-0014	SKT, 14 PIN DIP
25	25	XU1,XU3,XU4,XU5,XU6,	407-0016	SKT, 16 PIN DIP
		XU7XU8,XU9,XU10,XU11,		
		XU12,XU13,XU14,XU15,		
		XU16,XU17,XU18,XU19,		
		XU20,XU21,XU22,XU23,		
		XU24,XU25,XU26		
26	1	PCB	410-9323A	MODEL 4115B PCB
27	1		415-9525-1	M4115B FRONT PANEL
28	10	XDS1-120	415-9536	LED SPACER

NOTES: (Notes are for production use only.)

Keyboard Silkscreen



Keyboard Schematic (008-9323A)

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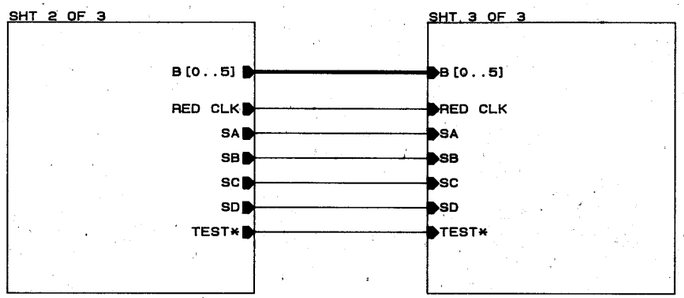
A	RELEASE	KM	[illegible]	1-91



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL CAPACITORS ARE IN MICROFARADS.
2. ALL RESISTORS ARE IN OHMS, 1/4W, 5%.
3. ALL POTENTIOMETERS ARE 1 TURN.

LEGEND:

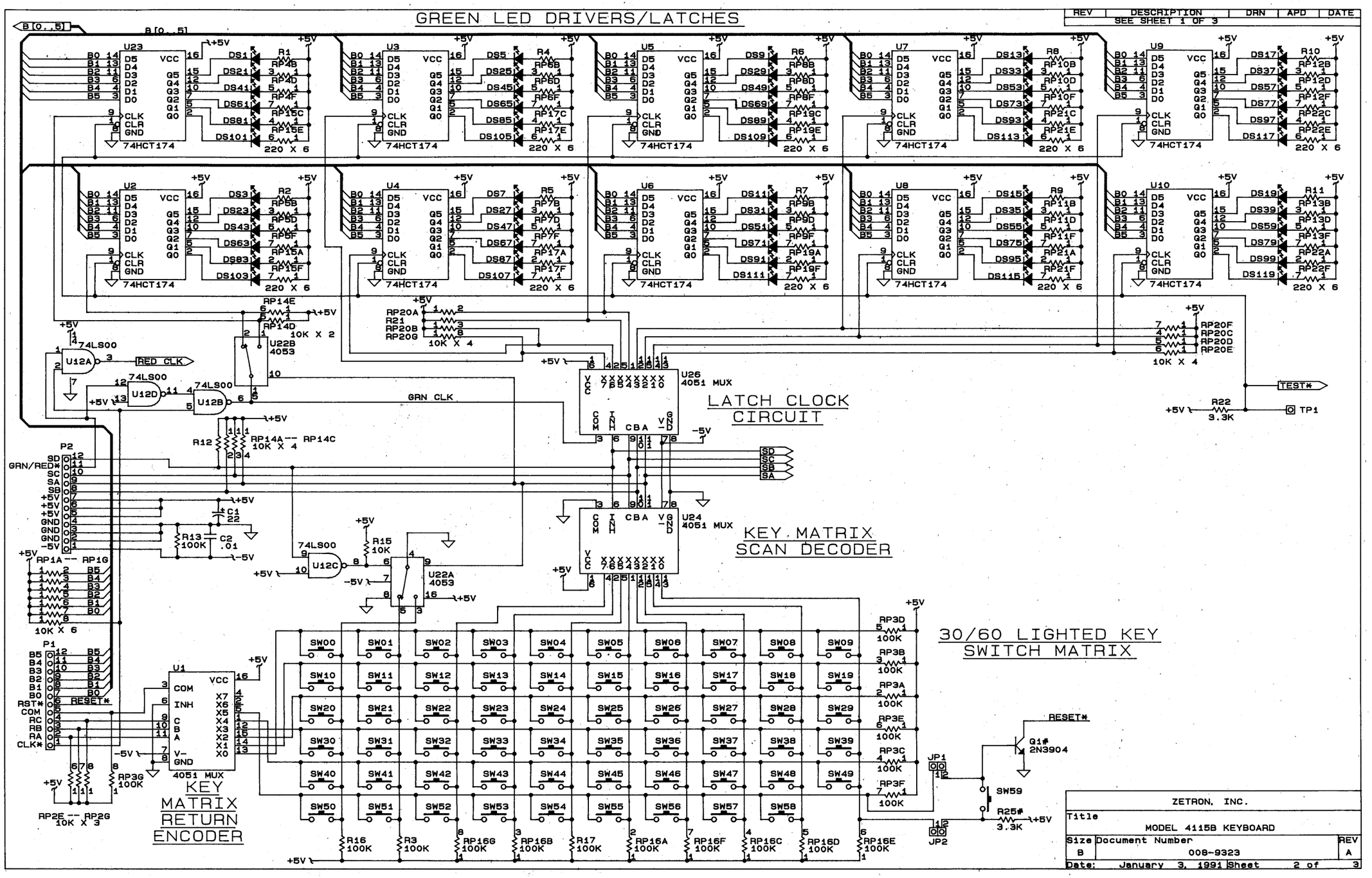
+	OPTION, INSTALL PER CUSTOMER ORDER.
^	INSTALLED ON HIGHER ASSEMBLY.
#	NOT INSTALLED.
———X———	CUT TRACE.
- - - - - - - - - -	JUMPER WIRE.

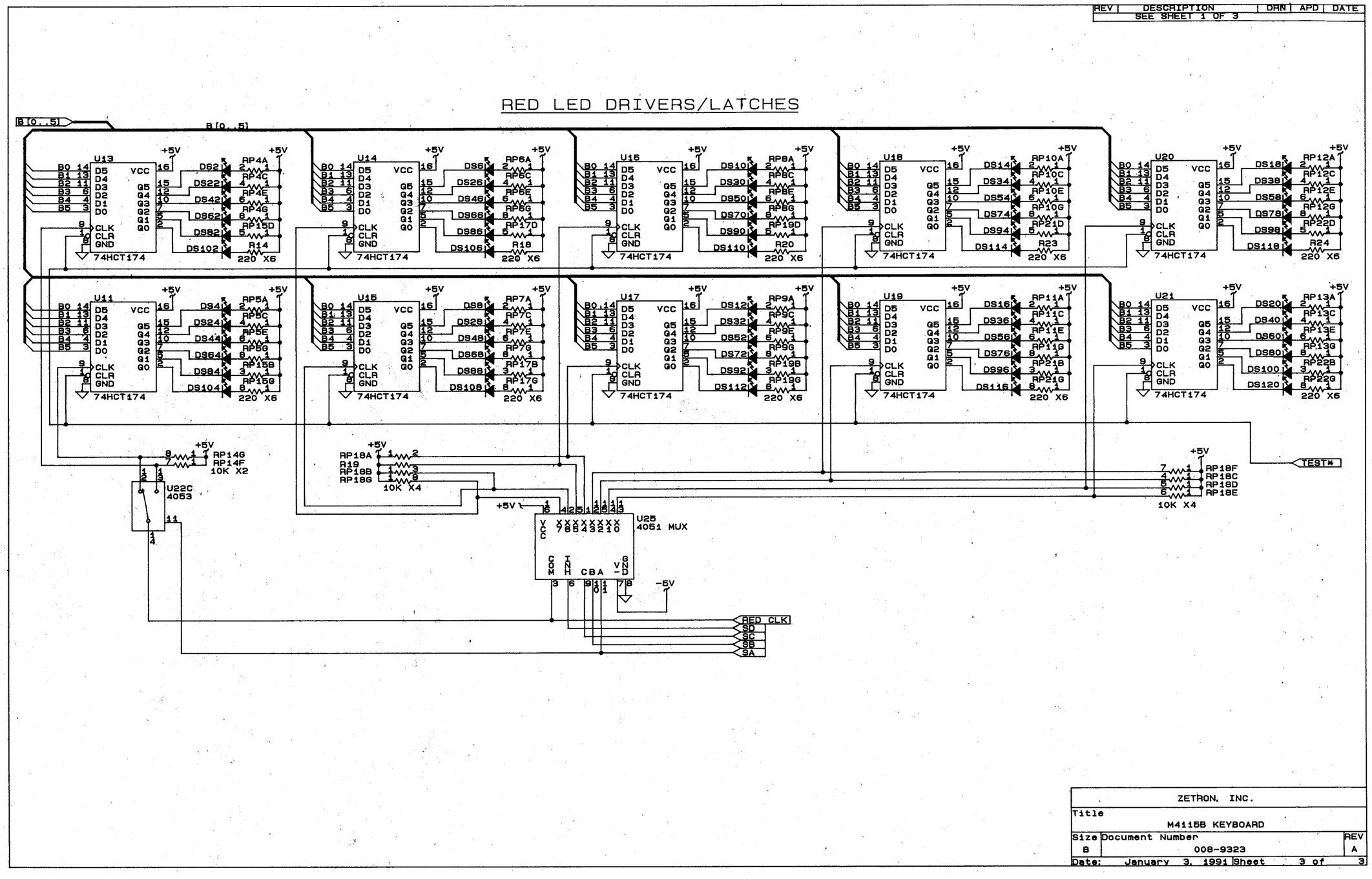
ZETRON, INC.
12335 134TH COURT N.E.
REDMOND, WASHINGTON, 98052-2433

Title: M4115B KEYBOARD

Size	Document Number	REV
B	008-9323	A

Date: January 2, 1991 Sheet 1 of 3


GREEN LED DRIVERS/LATCHES
REV | DESCRIPTION | DRN | APD | DATE
SEE SHEET 1 OF 3
B[0..5]
74HCT174
220 X 6
LATCH CLOCK CIRCUIT
U26 4051 MUX
KEY MATRIX SCAN DECODER
U24 4051 MUX
30/60 LIGHTED KEY SWITCH MATRIX
KEY MATRIX RETURN ENCODER
U1 4051 MUX
RED CLK
GRN CLK
RESET*
TEST*
TP1
Q1# 2N3904
ZETRON, INC.
MODEL 4115B KEYBOARD
Size B
Document Number 008-9323
REV A
Date: January 3, 1991 Sheet 2 of 3


REV | DESCRIPTION | DRN | APD | DATE
SEE SHEET 1 OF 3
RED LED DRIVERS/LATCHES
B[0..5]
U13
U14
U16
U18
U20
U11
U15
U17
U19
U21
74HCT174
+5V
RP4A
RP4C
RP4E
RP4G
RP15D
R14
RP6A
RP6C
RP6E
RP6G
RP17D
R18
RP8A
RP8C
RP8E
RP8G
RP19D
R20
RP10A
RP10C
RP10E
RP10G
RP21D
R23
RP12A
RP12C
RP12E
RP12G
RP22D
R24
RP5A
RP5C
RP5E
RP5G
RP15B
RP15G
RP7A
RP7C
RP7E
RP7G
RP17B
RP17G
RP9A
RP9C
RP9E
RP9G
RP19B
RP19G
RP11A
RP11C
RP11E
RP11G
RP21B
RP21G
RP13A
RP13C
RP13E
RP13G
RP22B
RP22G
220 X6
RP14G
RP14F
10K X2
U22C
4053
RP18A
R19
RP18B
RP18G
10K X4
U25
4051 MUX
-5V
RP18F
RP18C
RP18D
RP18E
TEST*
RED CLK
SD
SC
SB
SA
ZETRON, INC.
Title
M4115B KEYBOARD
Size B
Document Number 008-9323
REV A
Date: January 3, 1991 Sheet 3 of 3

Controller Board Parts List (702-9167E)

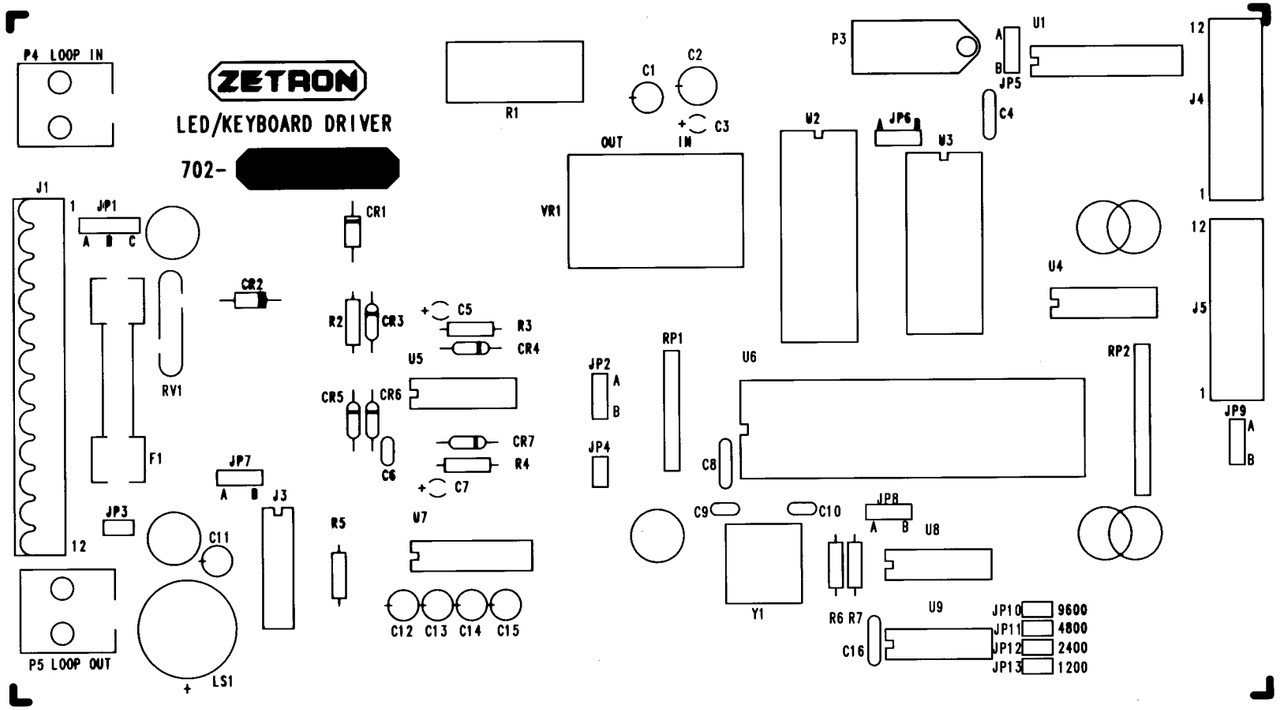
LEGEND:
+ = OPTION
# = NOT INSTALLED
^ = INSTALLED ON HIGHER ASSY

ZETRON MODEL 4115 CONTROLLER BD PARTS LIST (702-9167E)

Item	Qty	Reference	Part	Description	Mfg.Part No.
1	3	R5,R6,R7	101-0057	220 OHM 1/4W 5% CARBON FILM	
2	1	R2	101-0089	4.7K 1/4W 5% CARBON FILM	
3	1	R3	101-0125	150K 1/4W 5% CARBON FILM	
4	1	R4	101-0138	510K 1/4W 5% CARBON FILM	
5	1	R1 (NOTE 1)	103-3050	5 OHM 5W 5% CARBON FILM	PW PW5
6	1	RV1	105-0002	VARISTOR 14V AC	V22ZA3
7	1	RP2	119-0006	10K x 9 R-SIP	4610X-101-103
8	1	RP1	119-0008	10K x 7 R-SIP	EXB-F8E103G or J
9	3	C4,C8,C16	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	DF-103Z
10	2	C9,C10	151-0022	22PF 50V +-10%	CN15C220K
11	1	C6	151-0180	.1 UF 50V +-10% CERAMIC, UNSTABLE	AVXSR205E104MAA
12	3	C3,C5,C7	154-0025	1 UF 35V TANTALUM	ECS-F-35E1
13	5	C1,C11#,C12,C13, C14,C15	155-0052	10 UF 35V +-20% RADIAL ALUM. ELEC.	ECEA1VU100
14	1	C2	155-0077	100UF 25V +-20% RADIAL ALUM. ELEC.	ECEA1EU101
15	0	LS1#	305-0002	AUDIO SPEAKER	AT-02
16	1	U7	316-0232	RS232 DRIVER	AD232JN
17	1	VR1	316-7805	REGULATOR, +5V 1.5A	LM340T-5
18	1	U3	321-6116	RAM 2Kx8 (450NS)	CXK5816PN-15L
19	1	U6	321-6303	MICROPROCESSOR CMOS	HD6303YP
20	0	U2^	322-7128	16Kx8 250NS EPROM	27128TMS
21	1	U1	324-4374	OCTAL DFF REG	MC74HC374N
22	1	U9	324-4393	DUAL 4 BIT COUNTER	MC74HC393
23	1	U4	324-7400	QUAD NAND	MC74HC00
24	1	U8	324-7408	QUAD 2 IN AND	74HC08
25	1	U5	324-7414	HEX SCHMIDT	74HC14
26	1	CR2	342-0001	SILICON 1A 100V .50 SP	1N4002
27	5	CR3,CR4,CR5,CR6,CR7	342-3009	SILICON .50 SP	1N4148
28	1	CR1	343-3017	1/2 WATT 6.2V 5% .25 SP	1N5234B
29	1	Y1 (NOTE 2)	376-0004	4.000 MHz HC 18 CASE	SKO-DS400A
30	2	J4,J5	401-0009	12-POS THRU PCB	22-14-2124
31	0	J1#	401-0015	12 POS BLOCK MALE	1103.6
32	0	P3#	401-0029	3 PIN POWER CONN	10-18-1032
33	2	P4,P5	401-0078	4 PIN TELCO MNT	520257-2
34	0	JP3#,JP10#,JP11#, JP12#,JP13#	403-0002	2 OF 401-0052	
35	1	JP2#,JP5#,JP6,JP7#, JP8#,JP9#	403-0003	3 OF 401-0052	
36	1	JP1	403-0004	4 OF 401-0052	
37	0	J3#	407-0016	SKT, 16 PIN DIP	640358-3
38	0	JP4#	408-0001	WIRE JUMPER (24GA WIRE .35)	
39	1	F1	416-1576	FUSE AGC 1 A	AGC 1
40	1	XVR1	210-0001	KEPT NUT	
41	1	XVR1	220-0102	440X3/8 PAN PHILLIPS	
42	1	XVR1	381-0010	HEATSINK TO-220	
43	2	XJP1,XJP6 (POS A)	402-3040	MINI JUMPER	
44	4	XU4,XU5,XU8,XU9	407-0014	SKT, 14 PIN DIP	
45	1	XU7	407-0016	SKT, 16 PIN DIP	
46	1	XU1	407-0020	SKT, 20 PIN DIP	
47	1	XU3	407-0024	SKT, 24 PIN DIP	
48	1	XU2	407-0028	SKT, 28 PIN DIP	
49	1	XU6	407-0064	SKT, 64 PIN DIP	
50	6	XJP10 (IN) XJP9 (POS A) XJP2,XJP5,XJP7,XJP8 (POS B)	408-0001	WIRE JUMPER (24GA WIRE .35)	
51	2	XF1	416-3040	FUSE CLIP	
52	1	PCB	410-9023F	LED/KEYBOARD DRIVER	
53	A/R	XVR1	561-0001	THERMAL COMPOUND	

NOTES: (Notes are for production use only.)

Controller Board Silkscreen



Controller Board Schematic (008-9167E)