MPX 500

24-Bit Dual Channel Processor

Service Manual

lexicon

Precautions

Save these instructions for later use.

Follow all instructions and warnings marked on the unit.

Always use with the correct line voltage. Refer to the manufacturer's operating instructions for power requirements. Be advised that different operating voltages may require the use of a different line cord and/or attachment plug.

Do not install the unit in an unventilated rack, or directly above heat producing equipment such as power amplifiers. Observe the maximum ambient operating temperature listed in the product specification.

Slots and openings on the case are provided for ventilation; to ensure reliable operation and prevent it from overheating, these openings must not be blocked or covered. Never push objects of any kind through any of the ventilation slots. Never spill a liquid of any kind on the unit.

This product is equipped with a 3-wire grounding type plug. This is a safety feature and should not be defeated.

Never attach audio power amplifier outputs directly to any of the unit's connectors.

To prevent shock or fire hazard, do not expose the unit to rain or moisture, or operate it where it will be exposed to water.

Do not attempt to operate the unit if it has been dropped, damaged, exposed to liquids, or if it exhibits a distinct change in performance indicating the need for service.

This unit should only be opened by qualified service personnel. Removing covers will expose you to hazardous voltages.

This triangle, which appears on your component, alerts you to the presence of uninsulated, dangerous voltage inside the enclosure... voltage that may be sufficient to constitute a risk of shock.

This triangle, which appears on your component, alerts you to important operating and maintenance instructions in this accompanying literature.

Notice

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designated to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the computer with respect to the receiver
Move the computer away from the receiver
Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to identify and Resolve Radio/TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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Safety Suggestions

Read Instructions Read all safety and operating instructions before operating the unit.

Retain Instructions Keep the safety and operating instructions for future reference.

Heed Warnings Adhere to all warnings on the unit and in the operating instructions.

Follow Instructions Follow operating and use instructions.

Heat Keep the unit away from heat sources such as radiators, heat registers, stoves, etc., including amplifiers which produce heat.

Ventilation Make sure that the location or position of the unit does not interfere with its proper ventilation. For example, the unit should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a cabinet which impedes the flow of air through the ventilation openings.

Wall or Ceiling Mounting Do not mount the unit to a wall or ceiling except as recommended by the manufacturer.

Power Sources Connect the unit only to a power supply of the type described in the operating instructions, or as marked on the unit.

Grounding or Polarization* Take precautions not to defeat the grounding or polarization of the unit's power cord.

*Not applicable in Canada.

Power Cord Protection Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to cords at plugs, convenience receptacles, and the point at which they exit from the unit.

Nonuse Periods Unplug the power cord of the unit from the outlet when the unit is to be left unused for a long period of time.

Water and Moisture Do not use the unit near water — for example, near a sink, in a wet basement, near a swimming pool, near an open window, etc.

Object and liquid entry Do not allow objects to fall or liquids to be spilled into the enclosure through openings.

Cleaning The unit should be cleaned only as recommended by the manufacturer.

Servicing Do not attempt any service beyond that described in the operating instructions. Refer all other service needs to qualified service personnel.

Damage requiring service The unit should be serviced by qualified service personnel when:

the power supply cord or the plug has been damaged,

objects have fallen, or liquid has been spilled into the unit,

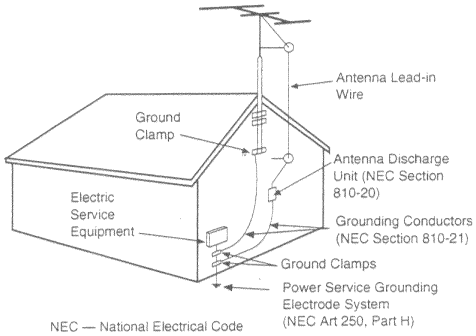
the unit has been exposed to rain,

the unit does not appear to operate normally or exhibits a marked change in performance,

the unit has been dropped, or the enclosure damaged.

Outdoor Antenna Grounding If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See figure below.

Power Lines An outside antenna should be located away from power lines.



NEC — National Electrical Code

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service and repair of this instrument. Failure to comply with these precautions, or with specific warnings elsewhere in these instructions violates safety standards of design manufacture and intended use of the instrument. Lexicon assumes no liability for the customer's failure to comply with these requirements.

GROUND THE INSTRUMENT

To minimize shock hazard the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor AC power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing and adjusting.

SAFETY SYMBOLS

General definitions of safety symbols used on equipment or in manuals.

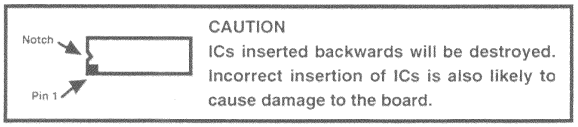
Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.

Indicates dangerous voltage. (Terminals fed from the interior by voltage exceeding 1000 volts must be so marked.)

WARNING — The WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition or the like which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION — The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, condition or the like which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE: The NOTE sign denotes important information. It calls attention to procedure, practice, condition or the like which is essential to highlight.



CAUTION

ICs inserted backwards will be destroyed. Incorrect insertion of ICs is also likely to cause damage to the board.

CAUTION

Electrostatic Discharge (ESD) Precautions

The following practices minimize possible damage to ICs resulting from electrostatic discharge or improper insertion.

- Keep parts in original containers until ready for use.
- Avoid having plastic, vinyl or styrofoam in the work area.
- Wear an anti-static wrist-strap.
- Discharge personal static before handling devices.
- Remove and insert boards with care.
- When removing boards, handle only by non-conductive surfaces and never touch open-edge connectors except at a static-free workstation.*
- Minimize handling of ICs.
- Handle each IC by its body.
- Do not slide ICs or boards over any surface.
- Insert ICs with the proper orientation, and watch for bent pins on ICs.
- Use anti-static containers for handling and transport.

*To make a plastic-laminated workbench anti-static, wash with a solution of Lux liquid detergent, and allow to dry without rinsing.

Table of Contents

Chapter 1 Reference Documents, Required Equipment

Reference Documents

MPX 500 User Guide - Lexicon P/N 070-14116 or latest revision

Required Equipment

Tools

The following is a minimum suggested technician's tool kit required for performing disassembly, assembly and repairs:

- Clean, antistatic, well lit work area.
- (1) #1 Phillips tip screwdriver
- (1) T9 Torx screwdriver
- (1) 3/16" Hex socket nut driver
- (1) 5/16" Hex socket, full hollow, nut driver with plastic insert (to prevent Front Panel scratches)
- (1) 15mm Hex socket nut driver
- Solder: 63/37 - Tin/Lead Alloy composition, low residue, no-clean solder.
- Magnification glasses and lamps
- SMT Soldering / Desoldering bench-top repair station

Test Equipment

The following is a *minimum* suggested equipment list required to perform the proof of performance tests.

- Amplifier with speakers or headphones.
- Cables: (dependent on your signal source)
  - Audio Input cable (balanced) with shield and a XLR or ¼ " plug on one end and an appropriate connector on the opposite end for connection to the Low Distortion Oscillator.
  - Audio Output cable (balanced) with shield and a XLR or ¼ " plug on one end and an appropriate connector on the opposite end for connection to the Distortion Analyzer.
  - (1) MPX 500 Power Cord (choose accordingly):
    - CORD,POWER,NA/IEC,SVT,VW-1,10A, N. AMER Lexicon P/N 680-09149
    - CORD,POWER,IEC, 6A, 2M, EURO Lexicon P/N 680-08830
    - CORD,POWER,IEC, 5A, 2M, UK Lexicon P/N 680-10093
    - CORD,POWER,IEC, 6A, 2M, ITALY Lexicon P/N 680-10094
    - CORD,POWER,IEC, 6A, 2M, SWISS Lexicon P/N 680-10095
    - CORD,POWER,IEC, 6A, 2M, AUSTRALIA Lexicon P/N 680-10096
    - CORD,POWER,IEC, 6A, 2M, JAPAN Lexicon P/N 680-10097
    - CORD,POWER,IEC, 6A, 2M, UNIVERSAL Lexicon P/N 680-10098
- (1) Low Distortion Oscillator with Single-ended or balanced output , <100 ohms output impedance, < 0.005% THD.
- (1) analog Distortion Analyzer and Level Meter with single-ended or balanced input, switchable 30Hz highpass filter or audio bandpass (20-20kHz) filter
- (1) 100 MHz oscilloscope

Chapter 2 General Information

Periodic Maintenance

Under normal conditions the MPX 500 requires minimal maintenance. Use a soft, lint-free cloth slightly dampened with warm water and mild detergent to clean the exterior surfaces of the connector box.

Do not use alcohol, benzene or acetone-based cleaners or any strong commercial cleaners. Avoid using abrasive materials such as steel wool or metal polish. It the unit is exposed to a dusty environment, a vacuum or *low-pressure* blower may be used to remove dust from the unit's exterior.

Ordering Parts

When ordering parts, identify each part by type, price and Lexicon Part Number. Replacement parts can be ordered from:

LEXICON, INC.
3 Oak Park
Bedford, MA 01730-1441
Telephone: 781-280-0300; Fax: 781-280-0499; email: csupport@lexicon.com
ATTN: Customer Service

Returning Units to Lexicon for Service

Before returning a unit for warranty or non-warranty service, consult with Lexicon Customer Service to determine the extent of the problem and to obtain Return Authorization. No equipment will be accepted without Return Authorization from Lexicon.

If Lexicon recommends that a MPX 500 be returned for repair and you choose to return the unit to Lexicon for service, Lexicon assumes no responsibility for the unit in shipment from the customer to the factory, whether the unit is in or out of warranty. All shipments must be well packed (using the original packing materials if possible), properly insured and consigned, prepaid, to a reliable shipping agent.

When returning a unit for service, please include the following information:

- Name
- Company Name
- Street Address
- City, State, Zip Code, Country
- Telephone number (including area code and country code where applicable)
- Serial Number of the unit
- Description of the problem
- Preferred method of return shipment
- Return Authorization #, on both the inside and outside of the package

Please enclose a brief note describing any conversations with Lexicon personnel (indicate the name of the person at Lexicon) and give the name and telephone daytime number of the person directly responsible for maintaining the unit.

Do no include accessories such as manuals, audio cables, footswitches, etc. with the unit, unless specifically requested to do so by Lexicon Customer Service personnel.

Chapter 3 Specifications

Analog Inputs

Connectors: XLR/TRS balanced
Impedance: 50k balanced; 25kΩ unbalanced
A/D Dynamic Range: 1058dB, typical
Levels: +20 to +8dBu full scale
Resolution: 24-Bit Sigma-Delta Conversion

Analog Outputs

Connectors: XLR/TRS balanced
Impedance: <600Ω
D/A Dynamic Range: 101dB, typical
Levels: +26dBu balanced; +20dBu unbalanced
Resolution: 24-Bit Sigma-Delta Conversion

Frequency Response: 20Hz-20kHz ±1dB
Crosstalk: -96dB @ 1kHz
THD: <0.5%, 20Hz-20kHz

Digital Audio Interface

Connectors: Coaxial RCA; S/PDIF (IEC-958, CP-340)

System Sample Rates

Internal Clock and S/PDIF Input: 44.1kHz, 48kHz

Display: 150 x 32 LCD, Backlit

Footswitch: Tip/Ring/Sleeve phone jack for Bypass and Tap (optional)

MIDI Interface: Connectors: IN, OUT/THRU

System Specifications

Power Requirements: 90-250V 50-60Hz; 12.5W; 3-pin IEC Connector
RFI/ESD: FCC Class B; European EMC Directive 89/336/ECC
Environment: Operating Temperature: 32°-104°F (0°-40°C); Relative Humidity: 95% non-condensing
Dimensions: 19"W x 1.75"H x 5.5"D (483x45x140.25mm)
Weight: 3 lbs (1.4kg)

Chapter 4 Performance Verification

This section describes a quick verification of the operation of the MPX 500 and the integrity of its analog and digital audio signal paths.

Diagnostics:

The MXP 500 contains two types of Diagnostics: Power Up Diagnostics, and Extended Diagnostics. Each of these will be described fully in Chapter 5: Troubleshooting. When the MPX 500 is powered on, the Power up Diagnostics run automatically to verify proper operation of its internal systems. The Power Up Diagnostics consist of the following tests:

ROM Test
SRAM Test
WCS Test
INT Test
ADF Test
EEPROM Test

Setup:

1. Turn on the MPX 500 and wait for the Power Up Diagnostics cycle to finish.
2. Enter System Mode by pressing the System button.
3. Use Edit Knob 1 to select the following System Parameters and Edit Knob 3 to set the parameter as noted:
   3.1. Output Level: 0dB
   3.2. Input Source: Analog Stereo
   3.3. Clock Source: Internal 44.1k
   3.4. Bypass Mode: Dry
4. Press the System button to return to the previous running mode.
5. Turn the Program Select Knob to Program #1.
6. Press the Bypass button on the front panel and verify that the button LED lights.
7. Connect a (balanced) audio cable between the Low Distortion Oscillator and the MPX 500 Left Input.
8. Connect a (balanced) audio cable between the MPX 500 Left output and the Distortion Analyzer.
9. Set the Distortion Analyzer to measure Vrms.
10. Turn the Input Trim knob fully clockwise.

I/O Tests:

These tests will verify the audio performance of the MPX 500's audio input and output circuitry

Analog In To Analog Out Level Test:

1. Apply a 1kHz sinewave signal to the MPX 500 Left Input @ 1.946Vrms.
2. Adjust the Input Trim knob and measure the output for a level between 15.46 and 13.78Vrms.
3. Move the cables to the Right Input/Output connections and repeat step 2.

Frequency Response Test:

These tests will verify the frequency response specifications of the Left and Right analog inputs to the Left and Right analog output signal paths of the MPX 500.

Analog In To Analog Out Frequency Test:

1. Disable all Filters on the Distortion Analyzer
2. Apply a 1kHz sinewave signal to the MPX 500 Left Input @ 3.083Vrms

3. Connect the Left Output to the Distortion Analyzer.
4. Set the Analyzer for a 0dB reference (@1kHz).
5. Sweep the Oscillator from 20Hz to 20kHz and verify the level to be within +/- 1.0dBr through out the sweep.
6. Move the cables to the Right Input/Output connections and repeat step 4 & 5.

THD+N Test:

These tests will verify the THD+N specifications of the MPX 500's Left and Right input to output circuitry.

Analog In To Analog Out THD+N Test:

1. Apply a 1kHz sinewave signal to the MPX 500 Left Input @ 6.904Vrms.
2. Connect the Left Output to the Distortion Analyzer.
3. Set the Distortion Analyzer to measure THD.
4. Enable the Low pass filters on the Analyzer (30kHz, 20kHz).
5. Verify the Left output, THD+Noise level on the Analyzer is < 0.005%.
6. Move the cables to the Right Inputs/Outputs connections and repeat step 5.

Crosstalk Tests:

These tests will verify the crosstalk specifications of the MPX 500's Left and Right input to output circuitry.

Analog In To Analog Out Crosstalk Test:

1. Apply a 1kHz sinewave signal to the MPX 500 Left Input @ 7.746Vrms.
2. Connect the Right Output to the Distortion Analyzer.
3. Enable the Low pass filters on the Analyzer (30kHz, 20kHz).
4. Sweep the Oscillator from 20Hz to 20kHz and verify the level to be >.245mVrms throughout the sweep.
5. Move the Input cable to the Right side and the Output cable to the Left and repeat step 4.

Dynamic Range Tests:

These tests will verify the Dynamic Range specifications of the MPX 500's Left and Right input to output circuitry.

Analog In To Analog Out Dynamic Range Test:

1. Apply a 1kHz sinewave signal to the MPX 500 Left Input @ 7.746Vrms.
2. Connect the Left Output to the Distortion Analyzer.
3. Set the Distortion Analyzer for a 0dB reference
4. Remove the Input cable from the Left input.
5. Enable the Low pass filters on the Analyzer (30kHz, 20kHz).
6. Verify the Noise level at the Left Output is > -97dBr (.218mVrms); (-101 dBr typical).
7. Connect the 1kHz-sinewave signal to the Right Input of the MPX 500.
8. Move the Left Output cable to the Right Output.
9. Set the Distortion Analyzer for a 0dB reference.
10. Remove the Input cable from the Right input.
11. Enable the Low pass filters on the Analyzer (30kHz, 20kHz).
12. Verify the Noise level at the Right Output is > -97dBr (-101 dBr typical).

Repeat Tests @ 48K

Select Internal 48k Clock Source from System mode and repeat all of the above tests.

Digital I/O Functionality

This test will verify that the MPX 500 will pass a valid S/PDIF digital audio signal through its digital input and output circuitry.

1. Connect a Digital signal (CD player, DAT, or effects box) to the S/PDIF input jack on the back of the MPX 500.
2. Connect the S/PDIF output of the MPX 500 to a D/A device (M300) for conversion back to an analog signal.
3. Connect the analog output of the D/A device (M300) to your amplifier with speaker output. Be sure to turn the volume down on the amplifier.
4. Turn the volume up on your amplifier to a comfortable listening level and verify audio at the output and that it is free and clear of any audio defects (pops, clicks, static, etc.).

MIDI Functionality:

This test will verify that the MIDI Input and MIDI Output/Thru circuits are working.

The test will transmit data out of the MIDI OUT jack and will attempt to read the data through the MIDI IN jack.

Midi functionality is tested through the extended diagnostics of the MPX 500.

To enter the Extended Diagnostics, power on the unit while pressing down & holding the BYPASS button on the front panel of the MPX 500. When the EDIT LED is lit, the BYPASS button can be released. After it is released, the EDIT LED will go out and the LCD Display will indicate the first test, # 1 ROM. Turn the Program Knob CW until test # 10 Midi test is displayed.

Connect a 5 Pin Male DIN to 5 Pin Male DIN Cable (also known as a MIDI cable) between the MIDI IN jack and the MIDI OUT jack.

Press the Program Knob once to execute the test.

When the test is executed, the LCD Display will indicate the test is “Running…”, followed by the Pass/Fail status of the test.

To exit the test, press the Program Knob.

Footswitch Functionality:

Footswitch functionality is performed through the extended diagnostics of the MPX 500.

To enter the Extended Diagnostics, power on the unit while pressing down & holding the BYPASS button on the front panel of the MPX 500. When the EDIT LED is lit the BYPASS button can be released. After it is released, the EDIT LED will go out and the LCD Display will indicate the first test, # 1 ROM. Turn the Program Knob CW until test # 8 Switch test is displayed.

To perform this test, a Dual stereo style footswitch must be plugged into the Footswitch jack on the back of the MPX 500 using a ¼ tip/ring/sleeve cable.

Press the Program Knob once to execute the test.

Press the **LEFT FOOTSWITCH** (Ring). The BYPASS LED will light and the LCD Display will indicate “BYPASS”. The remaining LEDs will be off. When the **LEFT FOOTSWITCH** is released, the BYPASS LED will go off.

Press the **RIGHT FOOTSWITCH** (TIP). The TAP LED will light and the LCD Display will indicate “TAP”. The remaining LEDs will be off. When the **RIGHT FOOTSWITCH** is released, the TAP LED will go off.

To exit the test, press the Program Knob.

Listening Test:

Setup

1. Connect an audio cable between the output of the Low Distortion Amplifier and the MPX 500 Left and Right Inputs.
2. Connect two audio cables between the headphone amplifier inputs and the MPX 500 Left and Right outputs.
3. Set the headphone amplifier volume control to its lowest level.
4. Set the oscillator for 220Hz sinewave at 100mVrms.
5. Power on the MPX 500 and turn the program knob to the # 1 program Small Plate

Verify Clean Audio

1. Load Program # 1 Small Plate.
2. Set the reverb time to 2.04 seconds or greater, the Mix to 100% and Bypass to Off.
3. Put on headphones and set the headphone amplifier volume to a comfortable listening level.
4. Sweep the input knob over the entire range and verify that no pops, clicks, distortion, or static noises are heard when turning the knob.

Shock Test

1. Lift one side of the MPX 500 four inches off the work surface and drop
2. Verify that no audio or display intermittence is caused by this action.

NOTE: To prevent damaging the unit, keep one side of the unit touching the work surface at all times.

Test Files				Source						Analyzer							
Test Name	Upper Limit	Lower Limit	Sweep File	Left	Right	Freq (Hz)	Imp	Bal / Unbal	Gnd / Float	Measure	Typical Reading	Upper Limit	Lower Limit	Filter	Imp	Band (Hz)	Sample Rate
A-D 44K Tests				(dBu)	(dBu)												
AD44LVL	AD44LVLU	AD44LVLL	--------	8.00	8.00	997	50	Unbal	Float	LEVEL(dBFS)	-0.15	0.41	-0.71	Off	----	--------	44.1k
AD44FRQ	AD44FRQU	AD44FRQL	ADFRQ	0.00	0.00	22-20k	50	Unbal	Float	LEVEL(dBFS)	0.00	0.56	-0.56	Off	----	--------	44.1k
AD44THD	AD44THDU	AD44THDL	ADTHD	7.00	7.00	22-20k	50	Unbal	Float	FLTLVL(%)	>0.0025	0.0050	0.0007	BandRej	----	--------	44.1k
AD44XT	AD44XTU	AD44XTL	ADXT	8.00	8.00	22-20k	50	Unbal	Float	LEVEL(dBFS)	-105.00	-95.94	-140.00	Off	----	--------	44.1k
AD44DR	AD44DRU	AD44DRL	--------	-52.00	-52.00	997	50	Unbal	Float	FLTLVL(dBFS)	-106.00	-102.94	-140.00	BandRej	----	--------	44.1k
A-D 48K Tests				(dBu)	(dBu)												
AD44LVL	AD44LVLU	AD44LVLL	--------	8.00	8.00	997	50	Unbal	Float	LEVEL(dBFS)	-0.15	0.41	-0.71	Off	----	--------	48k
AD44FRQ	AD44FRQU	AD44FRQL	ADFRQ	0.00	0.00	20-20k	50	Unbal	Float	LEVEL(dBFS)	0.00	0.56	-0.56	Off	----	--------	48k
AD44THD	AD44THDU	AD44THDL	ADTHD	7.00	7.00	20-20k	50	Unbal	Float	FLTLVL(%)	>0.0025	0.0050	0.0007	BandRej	----	--------	48k
AD44XT	AD44XTU	AD44XTL	ADXT	8.00	8.00	20-20k	50	Unbal	Float	LEVEL(dBFS)	-105.00	-95.94	-140.00	Off	----	--------	48k
AD44DR	AD44DRU	AD44DRL	--------	-52.00	-52.00	997	50	Unbal	Float	FLTLVL(dBFS)	-106.00	-102.94	-140.00	BandRej	----	--------	48k
A-A 48K Tests				(dBu)	(dBu)												
AA48SET	AA48SETU	AA48SETL	--------	19.00	19.00	997	25	Bal	Float	AMPL(dBu)	25.00	25.25	24.75	Off	100k	10-500k	48k
AA48LVL	AA48LVLU	AA48LVLL	--------	19.00	19.00	997	25	Bal	Float	AMPL(dBu)	25.00	26.06	23.94	Off	100k	10-500k	48k
AA48FRQ	AA48FRQU	AA48FRQL	AAFRQ	12.00	12.00	20-20k	25	Bal	Float	AMPL(dBr)	0.00	1.06	-1.06	Off	100k	10-500k	48k
AA48THD	AA48THDU	AA48THDL	AATHD	19.00	19.00	20-20k	25	Bal	Float	THD+N(%)	>0.0035	0.0050	0.0007	Off	100k	10-22k	48k
AA48XT	AA48XTU	AA48XTL	AAXT	20.00	20.00	20-20k	25	Bal	Float	XTALK(dB)	-98.00	-95.94	-140.00	Off	100k	22-22k	48k
AA48SNR	AA48SNRU	AA48SNRL	----------	20.00	20.00	997	25	Bal	Float	AMPL(dBr)	-101.00	-96.94	-140.00	Off	100k	22-22k	48k
D-A 44K Tests				(dBFS)	(dBFS)												
DA44LVL	DA44LVLU	DA44LVLL	--------	0.00	0.00	997	----	--------	--------	AMPL(dBu)	26.00	26.56	25.44	Off	100k	10-500k	44.1k
DA44FRQ	DA44FRQU	DA44FRQL	DAFRQ	0.00	0.00	20-20k	----	--------	--------	AMPL(dBr)	0.00	0.56	-0.56	Off	100k	10-500k	44.1k
DA44THD	DA44THDU	DA44THDL	DATHD	0.00	0.00	20-20k	----	--------	--------	THD+N(%)	>0.0040	0.0050	0.0003	Off	100k	10-22k	44.1k
DA44XT	DA44XTU	DA44XTL	DAXT	0.00	0.00	20-20k	----	--------	--------	XTALK(dB)	-110.00	-95.94	-140.00	Off	100k	10-22k	44.1k
DA44DR	DA44DRU	DA44DRL	--------	-60.00	-60.00	997	----	--------	--------	AMPL(dBr)	-101.00	-96.94	-140.00	Off	100k	22-22k	44.1k
D-A 48K Tests				(dBFS)	(dBFS)												
DA48LVL	DA48LVLU	DA48LVLL	--------	0.00	0.00	997	----	--------	--------	AMPL(dBu)	26.00	26.56	25.44	Off	100k	10-500k	48k
DA48FRQ	DA48FRQU	DA48FRQL	DAFRQ	0.00	0.00	20-20k	----	--------	--------	AMPL(dBr)	0.00	0.56	-0.56	Off	100k	10-500k	48k
DA48THD	DA48THDU	DA48THDL	DATHD	0.00	0.00	20-20k	----	--------	--------	THD+N(%)	>0.0035	0.0050	0.0003	Off	100k	10-22k	48k
DA48XT	DA48XTU	DA48XTL	DAXT	0.00	0.00	20-20k	----	--------	--------	XTALK(dB)	-110.00	-95.94	-140.00	Off	100k	10-22k	48k
DA48DR	DA48DRU	DA48DRL	--------	-60.00	-60.00	997	----	--------	--------	AMPL(dBr)	-101.00	-96.94	-140.00	Off	100k	22-22k	48k

Chapter 5 Troubleshooting

Check the Lexicon web site for the latest software and information:

http://www.lexicon.com

The Lexicon Support Knowledgebase:
http://www.lexicon.com/kbase/kbase.asp

Diagnostics

The MXP 500 contains two types of Diagnostics: Power Up Diagnostics, and Extended Diagnostics. Each of these is described in this chapter.

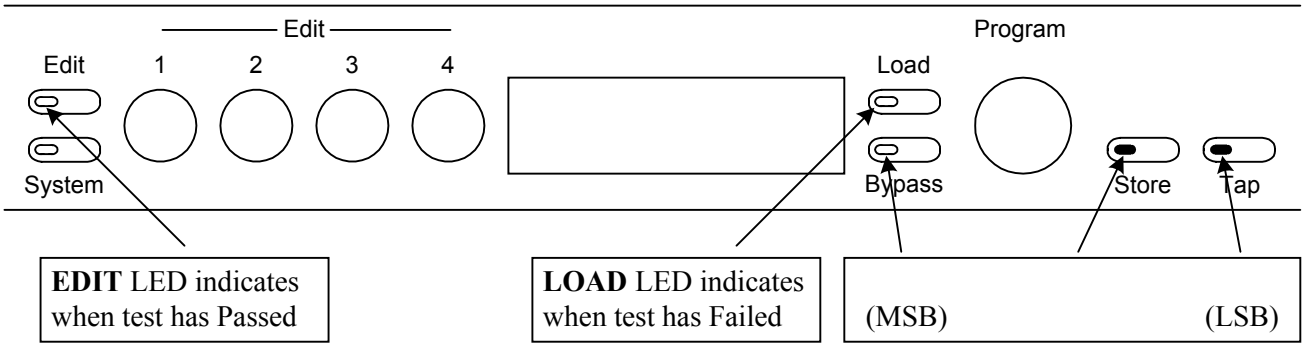
Power Up Diagnostics

On Normal power up, the MXP 500 will automatically execute a set of tests that comprise the Power Up Diagnostics. All front panel LEDs will be turned on for approximately 200ms, and then the MPX 500 will attempt to run the following sequence of tests. The tests have been designed to take less than 10 seconds.

ROM Test
SRAM Test
WCS Test
INT Test
ADF Test
EEPROM Test

Error Indication

If any of the Power Up Diagnostics tests fail, the LOAD LED will be turned on. The error message will be displayed on the front panel as shown in the example below. This will be true for all tests if an error occurs. To continue to the next test after a failure is reported press BYPASS.



The table below displays the Power Up Diagnostic test code which the front panel will display before the tests are executed.

Test No.	Test Name	Bypass	Store	Tap
1	ROM	0	0	1
2	SRAM	0	1	0
3	WCS	0	1	1
4	INT	1	0	0
5	ADF	1	0	1
6	EEPROM	1	1	0

0 = OFF
1 = ON

Test Descriptions

#1 ROM Test :

The ROM checksum, which is a byte size value, is located in the last location of each Bank. The test adds the contents of the entire ROM including the check sum byte. The result should equal a 0 for the test to pass.

#2 SRAM Test:

This test will verify the entire contents of the SRAM. The test first writes 00hex (000000000 binary) to all of the memory locations, and then verifies this by reading back all the memory locations. The test will also write/read the following patterns: 55hex (01010101 binary), AAhex (10101010 binary), and FFhex (11111111 binary).

If what is written to all locations is read back, the test will pass.

#3 WCS Test:

This test will verify the program memory space of the Lexichip 3. The Ram (memory space) is first filled with the value 55hex (01010101 binary), then each memory location is read back to confirm it contains the 55. The memory space is then filled with AAhex (10101010 binary) and the memory is read back again. The final test is the memory is filled with 0's. If what is written to all locations is read back, the test will pass.

#4 INT Test:

This test will verify that the Lexichip 3 interrupt (INT/) is working and occurring at the proper time intervals. The Lexichip 3 does this by providing this signal to the Z80's maskable interrupt line. If the Z80 sees the signal at the proper times the test will pass.

#5 ADF Test:

This test will verify that the Audio Data File in the Lexichip 3 is working properly. The Lexichip 3 Audio Data File (ADF) is a fast synchronous 128-word SRAM that provides audio data buffering and storage for external memory references, Serial I/O and the Host-to-Lexichip data port. ADF locations also function as ARU Registers and as scratchpad memory.

#6 EEPROM Test:

This test will verify the functions of the EEPROM on the MPX 500.

First the test will verify that the EEPROM has been initialized properly. This is done by storing the software version of the EPROM in the first five bytes of the EEPROM. Then the stored value is verified if correct

when the test is executed. If the stored value read from the first five bytes of the EEPROM is incorrect, the EEPROM will be initialized.

Second, the test will read each byte in the User Register portion of the EEPROM and add them together to calculate a checksum. This value is compared with the checksum value stored in the EEPROM itself. This checksum will be recalculated each time a register is stored.

Extended Diagnostics

Extended Diagnostics are provided to help in troubleshooting specific functions in the MPX 500.

To enter the Extended Diagnostics, power on the unit while pressing down & holding the BYPASS button on the front panel of the MPX 500. When the EDIT LED is lit, the BYPASS button can be released. After it is released, the EDIT LED will go out and the LCD Display will indicate the test number and it name. The Binary testcode will be displayed on the front panel (Bypass, Store, and Tap LEDs) as was described in the Power Up Diagnostics section earlier in this chapter.

The following is a complete list of tests in the Extended Diagnostics.

ROM Test
SRAM Test
WCS Test
INT Test
ADF Test
EEPROM Test
DRAM Test
Switch Test
Encoder Test
MIDI Test
LCD Test
Exit Test
Init
Burn In Test

When each of these tests are run, they will display the test code and report an error the same way the Power Up Diagnostic did. Unlike the power Up diagnostics however, each can be chosen individually by turning the PROGRAM knob. Once a test is selected, execution of the test is done by pressing the Program knob.

The table below displays each Extended Diagnostic test and the code the front panel will display before the tests are executed:

Test Number	Test Name	BYPASS LED	STORE LED	TAP LED	LCD Display
① 1	ROM	0	0	1	ROM
① 2	SRAM	0	1	0	SRAM
① 3	WCS	0	1	1	WCS
① 4	INT	1	0	0	INT
① 5	ADF	1	0	1	ADF
① 6	EEPROM	1	1	0	EEPROM
③ 7	DRAM	1	1	1	DRAM
② 8	Switch	0	0	0	Switch
③ 9	Encoder	0	0	0	Encode
③ 10	MIDI	0	0	0	MIDI
② 11	LCD	0	0	0	LCD
12	Exit	0	0	0	Exit
13	Init	0	0	0	Init
14	Unused	0	0	0	Unused
15	Unused	0	0	0	Unused
③ 16	Burn In	0	0	0	BurnIn

① These tests reside in the Power Up Diagnostics.
② Requires operator interaction and judgment. *Doesn't generate an error message.*
③ Requires operator interaction and judgment. *Generates an error message.*
0 = OFF
1 = ON

To execute each of the following tests, the BANK button must be pressed (PROGRAM knob).
The lower left side of the LCD will display the word Running … indicating that the test is working.
After the test has run its course, a Pass/Fail message will replace the Running… message indicating the results of the test.

The EDIT LED will light if the test Passes.
The LOAD LED will light if the test Fails.

Tests 1 to 11 can be run continuously by pressing the TAP button instead of the BANK button (PROGRAM knob) when executing the test.

#1 ROM Test :

The ROM checksum, which is a byte size value is located in the last location of each Bank. The test adds the contents of the entire ROM including the check sum byte. The result should equal a 0 for the test to pass.

#2 SRAM Test:

This test will verify the entire contents of the SRAM with the exception of the stack area which is tested by the power-up SRAM test. The test first writes 00hex (000000000 binary) to all of the memory locations, and then verifies this by reading back all the memory locations. The test will also write/read the following patterns: 55hex (01010101 binary), AAhex (10101010 binary), and FFhex (11111111 binary).

If what is written to all locations is read back, the test will pass.

#3 WCS Test:

This test will verify the program memory space of the Lexichip 3. The Ram (memory space) is first filled with the value 55hex (01010101 binary), then each memory location is read back to confirm it contains the 55. The memory space is then filled with AAhex (10101010 binary) and the memory is read back again. The final test is the memory is filled with 0s. If what is written to all locations is read back, the test will pass.

#4 INT Test:

This test will verify that the Lexichip 3 interrupt (INT/) is working and occurring at the proper time intervals. The Lexichip 3 does this by providing this signal to the Z80's maskable interrupt line. If the Z80 sees the signal at the proper times the test will pass.

#5 ADF Test:

This test will verify that the Audio Data File in the Lexichip 3 is working properly. The Lexichip 3 Audio Data File (ADF) is a fast synchronous 128-word SRAM that provides audio data buffering and storage for external memory references, Serial I/O and the Host-to-Lexichip data port. ADF locations also function as ARU Registers and as scratchpad memory.

#6 EEPROM Test:

This test has 2 parts that will verify the functions of the EEPROM in the MPX 500. The EEPROM will be initialized if either of the two parts of the test fail.

The First part of the test will read each byte in the User Register portion of the EEPROM and add them together to calculate a checksum. This value is compared with the checksum value stored in the EEPROM itself. This checksum will be recalculated each time a register is stored.

The Second part of the test will verify that the EEPROM has been initialized properly. This is done by storing the software version of the EPROM in the first five bytes of the EEPROM. Then the stored value is verified when the test is executed. If the stored value read from the first five bytes of the EEPROM is incorrect, the EEPROM will be initialized.

#7 DRAM Test:

The Z80 performs two tests to verify the DRAM, a Data test and an Address test.

In the Data test, the Z80 writes AA (hex) (10101010) into all of the memory locations then reads them back to check them. It repeats the process with 55 (01010101).

The Address test, the Z80 writes a count into the memory then reads it back (i.e. 00000001, 00000010, 00000011). This test will take approximately 45 seconds to complete.

#8 Switch Test:

The Switch Test diagnostics has two tests. The tests verify the operation of the Front panel switches (7) and Footswitches (2) along with their associated LEDs at the same time. The LCD Display will also indicate the name of the switch being pressed & held.

Footswitches:

To perform this test, a Dual stereo style footswitch must be plugged into the Footswitch jack on the back of the MPX 500 using a ¼" tip/ring/sleeve cable.

Press the **LEFT FOOTSWITCH** (Ring). The BYPASS LED will light and the LCD Display will indicate

"BYPASS". The remaining LEDs will be off. When the **LEFT FOOTSWITCH** is released, the BYPASS LED will go off.

Press the **RIGHT FOOTSWITCH** (TIP). The TAP LED will light and the LCD Display will indicate "TAP". The remaining LEDs will be off. When the **RIGHT FOOTSWITCH** is released, the TAP LED will go off.

Front Panel Switches:

Press and hold the **EDIT** button. The EDIT LED will light, and the LCD Display will indicate "EDIT". The remaining LEDs will be off. When the **EDIT** button is released, the EDIT LED will be turned off.

Press and hold the **SYSTEM** button. The SYSTEM LED will light, and the LCD Display will indicate "SYSTEM". The remaining LEDs will be off. When the **SYSTEM** button is released, the SYSTEM LED will be turned off.

Press and hold the **LOAD** button. The LOAD LED will light, and the LCD Display will indicate "LOAD". The remaining LEDs will be off. When the **LOAD** button is released, the LOAD LED will be turned off.

Press and hold the **BYPASS** button. The BYPASS LED will light, and the LCD Display will indicate "BYPASS". The remaining LEDs will be off. When the **BYPASS** button is released, the BYPASS LED will be turned off.

Press and hold the **STORE** button. The STORE LED will light, and the LCD Display will indicate "STORE". The remaining LEDs will be off. When the **STORE** button is released, the STORE LED will be turned off.

Press and hold the **TAP** button. The TAP LED will light, and the LCD Display will indicate "TAP". The remaining LEDs will be off. When the **TAP** button is released, the TAP LED will be turned off.

Press and hold the **BANK** button (PROGRAM knob). The LCD Display will indicate "BANK". The remaining LEDs will be off. When the **BANK** button (PROGRAM knob) is released, the LCD Display will indicate "Done".

#9 Encoder Test:

During this test, the Z80 microprocessor reads the value of the encoder being tested and then expects the next value read from the encoder (when the encoder position is moved) will be at a predetermined incremental value. Therefore, during the test each encoder must be rotated in a clockwise direction as it is being tested, or the test will fail.

When the test is executed, all front panel LEDs will be turned off and the LCD Display will indicate the encoder that is under test along with the hexadecimal value of the encoder's current position. The hexadecimal values range from (0-F) for the EDIT (1-4) encoders and from (00-1F) for the PROGRAM encoder. The encoders are tested in the following sequence: EDIT 1, EDIT 2, EDIT 3, EDIT 4 and PROGRAM.

When the test is executed, the LCD Display will indicate in the lower left corner the encoder under test (EDIT 1 -- XX) along with the hexadecimal value of the encoder's current position.

Turn the EDIT 1 encoder Clockwise (CW) one revolution (16 positions). The LCD Display will momentarily indicate the Pass/Fail status (i.e. EDIT 1 – PASS). Confirm and proceed to test the next encoder.

Turn the EDIT 2 encoder Clockwise (CW) one revolution (16 positions). The LCD Display will momentarily indicate the Pass/Fail status (i.e. EDIT 2 – PASS). Confirm and proceed to test the next encoder.
Turn the EDIT 3 encoder Clockwise (CW) one revolution (16 positions). The LCD Display will momentarily indicate the Pass/Fail status (i.e. EDIT 3 – PASS). Confirm and proceed to test the next encoder.

Turn the EDIT 4 encoder Clockwise (CW) one revolution (16 positions). The LCD Display will momentarily indicate the Pass/Fail status (i.e. EDIT 4 – PASS). Confirm and proceed to test the next encoder.

Turn the PROGRAM encoder Clockwise (CW) one and one half revolutions (32 positions). The LCD Display will indicate the Pass/Fail status (i.e. PROGRAM – PASS).

Pressing the BANK button (PROGRAM knob) will exit the test. The LCD Display will momentarily indicate "Done", then return to the Extended Diagnostics.

#10 MIDI Test:

This test will verify that the MIDI Input and MIDI Output/Thru circuits are working. The test will transmit data out of the MIDI OUT jack and will attempt to read the data through the MIDI IN jack.

To run this test, a 5 Pin Male DIN to 5 Pin Male DIN Cable (also known as a MIDI cable) must be connected between the MIDI IN jack and the MIDI OUT jack.

When the test is executed, the LCD Display will indicate the test is "Running…" followed by the Pass/Fail status of the test.

#11 LCD Test:

This test will verify all the elements of the display are working properly.

When the test is executed, the LCD Display will indicate the test is "Running…" and the LCD Display is filled with 3 random patterns until all of the pixels have turned black on the LCD Display.

Press and hold the **BANK** button (PROGRAM knob). This will clear all of the pixels on the LCD Display. Releasing the **BANK** button will exit the test.

The LCD Display will indicate "Done".

#12 Exit Test:

This selection will allow the user to exit the Extended Diagnostic Mode and enter normal operating mode. Pressing the **BANK** button (PROGRAM knob) will execute the test.

#13 Initialize Test:

This test will initialize all of the MPX 500 system parameters to their factory default settings.
Pressing the **BANK** button (PROGRAM knob) will execute the test.

WARNING: This procedure will destroy any user settings or registers.

#14 Unused:

#15 Unused:

#16 Burn In Test:

The Burn In test is structured to help in two ways.

One is for the factory. Once the unit is manufactured and tested it is placed in this burn in loop over a period of time to exercise the main circuitry and verify the unit is performing to manufactured specifications.
The second is for in field repair. It allows you to exercise the circuitry after repairs have been made. Again this is to insure the performance and specification of the MPX 500.

During the execution of the Diagnostics in the Burn In loop, the appropriate test code will be displayed on the Binary LED's (BYPASS, STORE & TAP). This code will be sent to the LEDs before each test is executed. By displaying a test/error code on the LEDs before the test is activated, it will be easier to determine which test failed if the unit hangs or crashes during the Burn In loop. The test numbers and names are also displayed on the LCD Display, along with the Pass/Fail status of each test. When the test is executed, the LCD Display will indicate the test is "Running…" followed by the Pass/Fail status of the test.

The following table shows the tests run in the Burn In Test.

Test Number	Test Name	Bypass LED	Store LED	Tap LED	LCD Display
1	ROM	0	0	1	ROM
2	SRAM	0	1	0	SRAM
3	WCS	0	1	1	WCS
4	INT	1	0	0	INT
5	ADF	1	0	1	ADF
7	DRAM	1	1	1	DRAM

0 = OFF
1 = ON

General Troubleshooting and Service Notes

Power Supply

- CAUTION: There is no protective paper covering power supply, IEC connector or power switch leads. Beware of exposed line voltages.
- The power supply module should not be repaired. The entire module should be replaced if failure occurs.

Front Panel Knobs

- It is difficult to remove the knobs on the front panel without causing damage to the either the knobs or front panel. Extra knobs should be kept on hand for repair needs.

Lexichip Replacement

- The Lexichip requires a heatsink that is installed with a thermal epoxy. The parts list contains the P/N for replacement heatsinks and the proper adhesive. Keep replacement heatsinks and adhesive on hand for repairs. Adhesive should be epoxy, thermally-conductive and equivalent to:
- Aavid Thermal Technologies part number
- 161000F00000 (10 gm) or
- 164000F00000 (40 gm)

Chapter 6 Theory of Operation

Schematic walkthrough

Sheet 1 (INPUT)

This sheet shows the input jacks, input amplifier (U12, U24) and A/D converter (U17) and their associated circuits.

The MPX500 is fitted with both ¼" balanced phone and XLR input connectors for left and right input signals. Inserting the ¼" phone plug on J11 or J12 will disconnect signals from XLR jack J10 and J13 respectively.

The following analog circuit description applies to the left signal channel; the function of the corresponding components in the right channel is identical. Capacitors C42 and C43, along with ferrite beads FB10 and FB11, prevent unwanted high frequency interference from entering of leaving through the input cables. DC blocking is achieved by capacitors C74 and C79 in line with each leg of balanced signal path. R71, R72, R74 and R75 along with C73 and C78 form a 6dB attenuator with a low-pass characteristic. Single stage input amplifier U12 buffers the attenuated input and supplies gain, which is variable from about +9 to +23dB, according to the setting of front-panel input trim control R149. The amplifier stage tends to balance an unbalanced input, more so when operated at the higher gain needed for low level, unbalanced signal sources. The differential signal from the amplifier is attenuated by R65-R68, ac coupled by C70 and C71, and biased to 2.5VDC through R62 and R63. The bias voltage is developed from +5VA by the voltage divider formed by R61 and R64, filtered by C68 and C69. The amplifier output is attenuated by about 18dB to drive the differential input of the A/D converter, which has a full-scale sensitivity of about +7dBu. The 14dB trim range varies the resulting full-scale input sensitivity from around +6dBV to +22dBu. Capacitors C92 and C98 at the converter input serve to reduce ailing of spectral components at the 5 to 6MHz oversampling frequency. The AK5383 (U17) is a 24bit, 128X over sampling 2 channel A/D converter configured to produce serial digital audio in I2S format.
For information on the AK5383 see http://www.akm.com/AKM/AKMprodinfo.htm

Sheet 2 (DAC)

This sheet shows the analog D/A converter (U11), filter and driver (U7, U8) and their associated circuits.

The 24 bit, 2 channel D/A converter CS4390 is configured to accept serial digital audio in I2S format. The following analog circuit description is for the left channel; the function of the corresponding components in the right channel is identical. The output of the converter feeds a differential multiple-feedback 2-pole low-pass filter having a gain of about +12dB, formed by one section of dual op-amp U7 and associated components. The other section of U7 inverts the single-ended filtered signal. The two outputs of U7 drive the balanced output through series resistors R35 and R33, which isolate the amplifiers from capacitive loads and present a differential output impedance of around 600 ohms. Output is available simultaneously on the parallel-wired XLR and ¼" phone jack connectors, J6 and J7. If unbalanced output wiring is used which grounds the ring of J7, R33 limits the current. Full-scale differential output from the converter is 2Vrms, or about +8dBu, which results in a full-scale output level of +26dBu balanced, +20dBu unbalanced. Capacitors C24 and C26, along with ferrite beads FB6 and FB7, prevent unwanted high frequency interference from entering or leaving through the output cables.

For information on CS4390 see http://www.cirrus.com/products/overviews/cs4380.html
Product data sheet (PDF) http://www.cirrus.com/ftp/pubs/4390.pdf

Sheet 3 (LEXICHIP3, ROM/RAM, uPROC)

This sheet shows the Z80 microprocessor (U13), EPROM (U9), EEPROM (U5), SRAM (U2), Audio DRAM (U6) and digital signal processor Lexichip3 (U10) and their associated circuits.

The configuration resistors R115-R122 on system data bus are used to program the Lexichip3 operating mode. Upon the rising edge of RESET/, various Lexichip3 mode bits are set which determines the system operating parameters. If any chip on the Z80 data bus erroneously drives the data bus during RESET/, the Lexichip3 will come up in the wrong mode and the Z80 will not function properly. Therefore, during RESET/, all the relevant chip enables must be pulled high and the Z80 must be fed clocks to allow the resistors to work as designed. Proper initialization of the system is dependent on the static state of the data bus on power up which is provided by R115-122 and on the default state of other lines governed by R10, R17, R23-24, R80-81, R54-56, R95, R76, R114. Be sure to check these and clocks if the system will not come up.

The Z80 (U13) handles all basic system control and user interface I/O operation. Normally, the Z80 clock ZCLK is derived from the Lexichip3 M_ZCLK pin, via GAL U20 (sheet 5). However, when RESET/ is asserted, before the Lexichip3 is functioning, the GAL feeds ZCLK from the 12.288MHz crystal oscillator. The Lexichip3 master clock (CLK_IN, pin 75), is driven by 256FS48, from the 12.288MHz crystal oscillator (sheet 5). All the system software and programs are stored in 256Kx8 EPROM (U9). The Z80's memory is a 32Kx8 SRAM (U2). User programs are stored in a 4kx8 EEPROM (U5). The EEPROM clock is driven by the Lexichip3 under program control. The serial data line (EEPROM_DATA) is bi-directional. R22 prevents excessive current in either the EEPROM or the Lexichip3 during power-up, when both chips might drive the line. The audio memory for the Lexichip3 is provided by 1Mx4 DRAM (U6). Note that all address decoding (RAM_EN/, ROM_EN/, etc.) is done within the Lexichip3. That is the primary reason the Z80 cannot function if the Lexichip3 is improperly initialized at the rising edge of RESET/.

Sheet 4 (ENCODERS)

This sheet shows the front panel PROGRAM EDIT encoders and their associated circuits.

Four-bit gray-code encoders SW1-SW4 are multiplexed two at a time onto a shared 8-bit bus, ENC [7-0], which is readable by software. Pull-up resistors R124-R131 default the bus to logic high.

Diodes D12-D15 (Program Edit 4 encoder), D16-D19 (Program Edit 3 encoder), D20-D23 (Program Edit 2 encoder), D24-D27 (Program Edit 1 encoder) are used to isolate the output of the unselected encoder pair during the reading of the selected encoder pair. An encoder is selected when its C pin is set low, which allows the encoder to assert its current position onto the ENC bus via the corresponding group of diodes. The C pin is controlled via Lexichip3 (sheet 3) PIO bits. In addition to the encoders, the closure of the individual front panel switches associated with D5, D6, D28, D29, D7, D8 and D9 can be read when SWITCH_SELECT/ (sheet 6, A5) is asserted. Software selects which set of signals is placed on the ENC bus by asserting ADJ12_SELECT/, ADJ34_SELECT/, or SWITCH_SELECT/. The state of the ENC bus is then read via the 74HC541 (U23).

Sheet 5 (MIDI, DIGITAL AUDIO OUT)

This sheet shows the Clock generation, MIDI I/O and S/PDIF I/O and their associated circuits.

At the center of the sheet are the crystal oscillators, which are the basis for the two sample rate clocks (44.1 kHz and 48 kHz). These clocks, 256FS441 and 256FS48M, plus 256FSPLL, from the digital audio receiver, are fed to 74HC153 (U15) where they are software selected via CLK_SEL0 and CLK_SEL1. A GAL16V8R-25 (U10) provides various clocks and control signals including ZRST/ to the Z80. The Lexichip3 is clocked by 256FS48, and is set to execute 255 instructions out of a possible 256. This means that it will execute DSP operations properly at 48 kHz + ca. 0.4% (1/256).

The MPX500 MIDI interface complies with the MIDI specification. It incorporates 5-pin female DIN connectors for input, thru and out (J2 and J3). J3 is shared for thu and out, according to how the Lexichip3 is programmed. MIDI INPUT is opto-coupled for ground isolation through U1 to the MIDI UART within the Lexichip3 (sheet 3). The MIDI OUTPUT signal is generated by the Lexichip3 (sheet 3) and is fed to current loop driver Q1 and out J3. FB1-2 and J2-3 shields connection to ground are to reduce RFI.

The S/PDIF OUT is generated by the Lexichip3 (sheet 3) and buffered by two gate sections of U3 (74HC132). The voltage divider formed by R13-R15 develops an open-circuit voltage at J5 of 1Vp-p, ac-coupled by C8 and C9. Output impedance is about 75Ω, which produces the standard 500mVp-p S/PDIF signal when connected to a 75Ω terminated load. The S/PDIF OUT is gated with RESET/ to mute the digital output.

S/PDIF IN connected to J5 is terminated in 75Ω by R18, ac-coupled by C13, and amplified by U4 (74HCU04). Current limiting resistor R19 and clamping diode D3 provide input protection. The amplified signal is demodulated by digital audio receiver CS8412 (U14), which delivers a serial stream in I2S format to the Lexichip3. The signals C0/, CA, CB, CC, CD, CE and ERF allow software to determine the lock, error status, and sample rate detected by U14. CK_6MHZ provides a reference clock used by U14 to determine incoming sample rate.

For information on CS8412 http://www.cirrus.com/products/overviews
Product data sheet (PDF) http://www.cirrus.com/ftp/pubs

Sheet 6 (DISPLAY DRIVER)

This sheet shows the footswitch jack, LCD connection, LCD contrast, led driver, SW #1 and SW#2 connections and their associated circuits.
The tip and ring of the footswitch ¼" phone jack (J4) connect to FOOT_TAP/ and FOOT_BYPASS/, respectively, through current-limiting resistors R11 and R12. Capacitors C5 and C6 filter out RFI. D10 and D11 help protect from over voltage or static discharge. Pull-up resistors R100 and R101 default the non-active switch state to logic high. FOOT_TAP/ and FOOT_BYPASS/ are fed to 74HC541 (U19), which allows software to determine the footswitch state.

Signals ENCA and ENCB are from the two-phase incremental rotary encoder on the SW1 board. The encoder bits are pulled-up by R86 and R87 and filtered by R85, R88, C102 and C103. Software determines the state of the encoder by reading U19.

Connector (J19) is the interface to the front-panel LCD module. R102-112 are series damping resistors for the LCD address, control and data lines. 10K-potentiometer (R2) adjusts the LCD contrast. The front-panel LED's on the SW#1 and SW#2 boards are controlled by software via U18 (74AC273) and associated current-limiting resistors.
For information on LCD (PDF) ftp://wfp62508.w1.com/s150gs32.pdf.

Sheet 7 (POWER SUPPLY)

This sheet shows the power supply, reset generator and their associated circuits.

The Reset generator is formed by two sections of U3 (74HC132), along with C11 (22uF) and R16 (1K). RESET/ is held low during initialization, immediately after power is applied.

Main power is applied to IEC connector (J1). The MPX500 incorporates a switching power supply module, which accepts main voltages from 90-240V AC. The power switch on front panel is in series with the main input to the power supply module. The supply delivers +/-15VDC and +5VDC, which is conditioned by capacitors, resistor and chokes shown.

Additional Sheets 1 each (SW#1, SW#2)

SW#1 incorporates (4) LED's, (4) switches, and encoder SW5, which connect to the MAIN board via J18. SW5 is a 24-position rotary encoder, which includes a push-action switch, used to access the bank function in system.
SW#2 incorporates (2) LED's and (2) switches, wired to the MAIN board via J20.

Chapter 7 - Parts List

MPX500 MAIN BOARD ASSEMBLY

PART NO.	DESCRIPTION	QTY	REFERENCE
120-14142	ADHESIVE,EPOXY,THERMAL		Lexichip Heatsink
200-14153	POT,RTY,10KB,KNURL,6MMX15MML	1.00	R2
200-14157	POT,RTY,10K15CX2,7MMFL,14,15L	1.00	R149
202-09794	RESSM,RO,0 OHM,0805	4.00	R28,30-32
202-09795	RESSM,RO,5%,1/10W,2.2K OHM	5.00	R9,20,96-98
202-09871	RESSM,RO,5%,1/10W,1K OHM	2.00	R16,78
202-09873	RESSM,RO,5%,1/10W,10K OHM	29.00	R1,10,17,23,24,29 R54-56,58,76,79-81 85-88,95,99,114-122
202-09899	RESSM,RO,5%,1/10W,47 OHM	15.00	R25-27,77,102-112
202-10557	RESSM,RO,5%,1/10W,4.7K OHM	2.00	R11,12
202-10558	RESSM,RO,5%,1/10W,47K OHM	12.00	R21,83,100,101 R124-131
202-10559	RESSM,RO,5%,1/10W,100 OHM	3.00	R19,57,84
202-10569	RESSM,RO,5%,1/10W,10 OHM	1.00	R59
202-10574	RESSM,RO,5%,1/10W,10M OHM	2.00	R82,123
202-10586	RESSM,RO,5%,1/4W,100 OHM	1.00	R53
202-10891	RESSM,RO,5%,1/10W,270 OHM	6.00	R89-92,132,133
202-11041	RESSM,RO,5%,1/10W,680 OHM	1.00	R22
202-11071	RESSM,RO,5%,1/4W,75 OHM	1.00	R18
202-11072	RESSM,RO,5%,1/4W,220 0HM	3.00	R5,7,8
202-11073	RESSM,RO,5%,1/4W,270 OHM	5.00	R6,33,35,43,45
202-11347	RESSM,RO,5%,1/4W,3 OHM	1.00	R113
202-11683	RESSM,RO,5%,1/10W,5.1 OHM	1.00	R60
203-10583	RESSM,RO,1%,1/10W,10.0K OHM	16.00	R34,36,41,42,44,46 R51,52,61,64,70,73 R134,137,143,146
203-10896	RESSM,RO,1%,1/10W,1.00K OHM	8.00	R62,63,66,68,135 R136,139,141
203-11075	RESSM,RO,1%,1/10W,95.3 OHM	1.00	R15
203-11079	RESSM,RO,1%,1/10W,715 OHM	2.00	R13,14
203-11723	RESSM,RO,1%,1/10W,4.75K OHM	4.00	R38,39,48,49
203-11992	RESSM,RO,1%,1/10W,174 OHM	4.00	R65,67,138,140
203-12481	RESSM,RO,1%,1/10W,1.5K OHM	2.00	R69,142
203-12837	RESSM,RO,1%,1/10W,13.0K OHM	8.00	R71,72,74,75,144 R145,147,148
203-12841	RESSM,RO,1%,1/10W,39.2K OHM	4.00	R37,40,47,50
240-01262	CAP,ELEC,330uF,25V,20%,RAD	1.00	C53
240-09367	CAPSM,ELEC,10uF,25V,NONPOL,20%	4.00	C74,79,119,124
240-09786	CAP,ELEC,100uF,25V,RAD,LOW ESR	3.00	C16,17,50
240-11827	CAPSM,ELEC,10uF,16V,20%	7.00	C63,69,90,95,96 C101,114
240-13216	CAPSM,ELEC,22uF,16V,20%	1.00	C11
240-13217	CAPSM,ELEC,47uF,16V,20%	4.00	C70,71,115,116
241-09798	CAPSM,TANT,10uF,10V,20%	3.00	C65,67,85
244-10423	CAP,MYL,.22UF,10%,RAD	5.00	C20,22,47,49,52
244-12322	CAP,MYL,.047uF,50V,RAD,5%,BOX	1.00	C83
245-09876	CAPSM,CER,.01uF,50V,Z5U,20%	6.00	C8,13,62,81,102,103
245-10561	CAPSM,CER,100pF,50V,COG,5%	2.00	C2,3
245-10562	CAPSM,CER,150pF,50V,COG,10%	15.00	C5,6,19,21,24,26

PART NO.	DESCRIPTION	QTY	REFERENCE
			C33,35,42-46,48,51
245-10587	CAPSM,CER,18pF,50V,COG,10%	2.00	C25,34
245-10976	CAPSM,CER,47pF,50V,COG,5%	6.00	C7,12,73,78,118,123
245-11594	CAPSM,CER,2200pF,50V,COG,5%	2.00	C92,98
245-11625	CAPSM,CER,33pF,50V,COG,5%	8.00	C72,77,87,88,109 C110,117,122
245-11626	CAPSM,CER,75pF,50V,COG,5%	4.00	C29,30,38,39
245-11899	CAPSM,CER,820pF,50V,COG,5%	4.00	C31,32,40,41
245-12485	CAPSM,CER,.1uF,25V,Z5U,20%	45.00	C1,4,9,10,14,15,18 C23,27,28,36,37 C54-61,64,66,68,75 C76,80,82,84,86,89 C91,93,94,97,99,100 C104-108,112,113 C120,121
270-06671	FERRITE CHOKE,2.5 TURN	3.00	FB3-5
270-11545	FERRITESM,CHIP,600 OHM,0805	16.00	FB1,2,6-19
300-10509	DIODESM,1N914,SOT23	26.00	D1,2,4-9,12-29
300-10563	DIODESM,DUAL,SERIES,GP,SOT23	3.00	D3,10,11
310-10510	TRANSISTORSM,2N3904,SOT23	1.00	Q1
330-10523	ICSM,DIGITAL,74HCU04,SOIC	3.00	U4,16,22
330-10528	ICSM,DIGITAL,74HC153,SOIC	1.00	U15
330-10535	ICSM,DIGITAL,74AC273,SOIC	1.00	U18
330-10537	ICSM,DIGITAL,74HC541,SOIC	3.00	U19,21,23
330-11990	ICSM,LEXICHIP3B,100PIN,PQFP	1.00	U10
330-12844	ICSM,DIGITAL,74HC132,SOIC	1.00	U3
340-11573	ICSM,LIN,NJM4580,DUALOPAMP,SOP	4.00	U7,8,12,24
345-12060	ICSM,INTER,CS8412,RCVR,SOIC	1.00	U14
350-12384	ICSM,DRAM,1MX4,60NS,SOJ	1.00	U6
350-13863	ICSM,SRAM,32KX8,70NS,SOIC,20uA	1.00	U2
350-14158	ICSM,EEPROM,24C32,32K,SER,SOIC	1.00	U5
350-14175	IC,ROM,27C020,MPX500,V1.04	1.00	U9
350-14176	ICSM,GAL,16V8,MPX500,V1.00	1.00	U20
355-12333	ICSM,DAC,CS4390,24BIT,STR,SSOP	1.00	U11
355-13829	ICSM,ADC,AKM5383,24b,96kHz,SOP	1.00	U17
365-09883	ICSM,uPROC,Z80,CMOS,10MHz,QFP	1.00	U13
375-12110	ICSM,OPTO-ISOL,HCPL0601,SOIC	1.00	U1
390-12361	CRYSTALSM,11.2896MHz,PAR,HC49	1.00	Y1
390-12362	CRYSTALSM,12.288MHz,PAR,HC49	1.00	Y2
452-11947	SW,RTY,ENC,16POS,4BIT,15.5L	4.00	SW1-4
510-07888	CONN,AC,3MC,PCRA,IEC,10A	1.00	J1
510-09790	CONN,DIN,5FC@180DEG,PCRA,SHLD	2.00	J2,3
510-10881	CONN,XLR,3MC,PCRA,PLASTIC CMPT	2.00	J6,9
510-11087	1/4"PH JACK,PCRA,3C,SW-TR,G,FT	5.00	J4,7,8,11,12
510-13149	CONN,RCA,PCRA,1FCGX2V,WH/RED,G	1.00	J5
510-14156	CONN,FFC,1.25MM,22POS,PCRA	1.00	J19
510-14159	CONN,XLR,3FC,PCRA,NO LATCH,SM	2.00	J10,13
520-09736	IC,SCKT,32 PIN,PC,TIN,LO-PRO	1.00	U9
620-12428	LUG,#4,INT STAR,XLR GND	2.00	J6,9
635-05689	FASTNR,SWAGE,PCB,4-40X.065,SS	4.00	PS TO MAIN BD
640-01706	SCRW,4-40X3/8,PNH,PH,ZN	2.00	AC CONN (J1)
640-04339	SCRW,4-40X1/4,PNH,PH,SEMS,ZN	4.00	PS TO MAIN BD
643-01732	NUT,4-40,KEP,ZN	2.00	AC CONN (J1)
650-03970	POPRVT,1/8X1/8,REG PROT HD,SS	1.00	BRKT TO MAIN BD
675-08256	WIRE,22G,BLU,2.5",.187QDC/ST	1.00	J17

675-08257	WIRE,22G,BRN,2.5",.187QDC/ST	1.00	J16

PART NO.	DESCRIPTION	QTY	REFERENCE
675-14137	WIRE,18G,GRN/YEL,7",#6RING/SS	1.00	AC CONN (J1) TO FP
680-14173	CABLE,.156,HSG/ST&T,4C,3"	1.00	J15
680-14174	CABLE,.100,HSG/ST&T,2C,3"	1.00	J14
701-14147	BRACKET,KEYSTONE,633,.140DX2	1.00	MAIN BD MTG
704-14132	HEATSINK,TO220,.75X.5X.5"H	1.00	U10
710-14120	PC BD,MAIN,MPX500	1.00	
750-14151	PWR SUP,+5V/+15V/-15V,16.5W	1.00	

MPX500 SW#1 BOARD ASSEMBLY

PART NO.	DESCRIPTION	QTY	REFERENCE
430-07326	LED,GRN,T1,LITON	4.00	D1-4
452-14155	SW,RTY,ENC,24POS,12MM,PBM	1.00	SW5
453-12166	SW,PBM,1P1T,6MMSQ,250GF	4.00	SW1-4
630-14190	SPCR,LED,T1,2MMH	4.00	D1-4
680-14171	CABLE,RIB,24-26AWG,14CX.1,3"L	1.00	J1
710-14130	PC BD,SW#1,MPX500	1.00	

MPX500 SW#2 BOARD ASSEMBLY

PART NO.	DESCRIPTION	QTY	REFERENCE
430-07326	LED,GRN,T1,LITON	2.00	D1,2
453-12166	SW,PBM,1P1T,6MMSQ,250GF	2.00	SW1,2
630-14190	SPCR,LED,T1,2MMH	2.00	D1,2
680-14170	CABLE,RIB,24-26AWG,6CX.1,3"L	1.00	J1
710-14140	PC BD,SW#2,MPX500	1.00	

MPX500 MECHANICAL ASSEMBLY

PART NO.	DESCRIPTION	QTY	REFERENCE
430-14152	DISP,LCD,150X32DOTS,12:00,FFC	1.00	
454-11095	SW,ROCKER,1P2T,6A@250,VERTSLIM	1.00	
550-11929	KNOB,.69D,6MM/FL,BLK,LINE	1.00	
550-11931	BUTTON,.24X.64,BLK,W/LT PIPE	6.00	
550-14168	KNOB,.85D,6MM/FL,BLK	4.00	
550-14169	KNOB,1.05D,6MM/FL,BLK	1.00	
630-14114	SPCR,4-40X7/16,3/16HEX,NYL	2.00	DISPLAY
635-12831	SPCR,.14IDX.25ODX.375L,AL	4.00	SW BDS TO FP
640-02812	SCRW,4-40X3/8,PNH,PH,BLK	7.00	COVER TO FP & SIDE PANELS AC CONN
640-14115	SCRW,4-40X3/16,PNH,PH,NYL	2.00	DISPLAY
641-11466	SCRW,TAP,#4X3/8,PNH,PH,BZ,TRI	9.00	XLR & RCA CONN
641-12759	SCRW,TAP,AB,#2X1/4,PNH,PH,BZ	4.00	DIN CONN
643-01732	NUT,4-40,KEP,ZN	6.00	SW BDS TO FP (4); KEYSTONE TO FP (1); AC CONN (1)
700-14164	COVER,MPX500	1.00	
702-14160	PANEL,FRONT,MPX500	1.00	
702-14163	PANEL,SIDE,1.71X5.42	2.00	
702-14177	COVER,PROTECTIVE,PS,4.10X4.10	2.00	COVER, INSIDE
703-14167	LENS,3.37X.87,CLR	1.00	

740-08558	LABEL,TUV CERTIFIED,BAYERN	1.00	TOP COVER
PART NO.	DESCRIPTION	QTY	REFERENCE
740-09538	LABEL,S/N,CHASSIS,PRINTED	1.00	REAR COVER
740-11482	LABEL,WARN/APP,FCC/C-UL/CE,PRO	1.00	TOP COVER
740-13573	LABEL,MFR ID,.9X.25,SILVER	1.00	REAR COVER

MPX500 POWER CORD OPTIONS

PART NO.	DESCRIPTION	QTY	REFERENCE
680-09149	CORD,POWER,NA/IEC,SVT,VW-1,10A	1.00	
680-08830	CORD,POWER,IEC,6A,2M,EURO	1.00	
680-10093	CORD,POWER,IEC,5A,2M,UK	1.00	
680-10094	CORD,POWER,IEC,6A,2M,ITALY	1.00	
680-10095	CORD,POWER,IEC,6A,2M,SWISS	1.00	
680-10096	CORD,POWER,IEC,6A,2M,AUSTRALIA	1.00	
680-10097	CORD,POWER,IEC,6A,2M,JAPAN	1.00	
680-10098	CORD,POWER,IEC,6A,2M,UNIVERSAL	1.00	

MPX500 SHIPPING MATERIAL

PART NO.	DESCRIPTION	QTY	REFERENCE
070-14116	GUIDE,USER,MPX500	1.00	
070-14117	NOTICE,S/W REL,MPX500	1.00	
730-06785	CARD,WARRANTY,LEXICON,5.5X7	1.00	
730-09509	CARD,REGISTRATION,GENERAL	1.00	
730-14180	CERTIFICATE,CE,MPX500	1.00	
730-14181	INSERT,FOAM,ENDCAP,1UX5.5	2.00	
730-14182	BOX,22X8X4,250LB	1.00	
730-14183	SLEEVE,DSPLY,MPX500	1.00	
740-07693	LABEL,LEXICON DIG AUDIO,3"X5"	2.00	

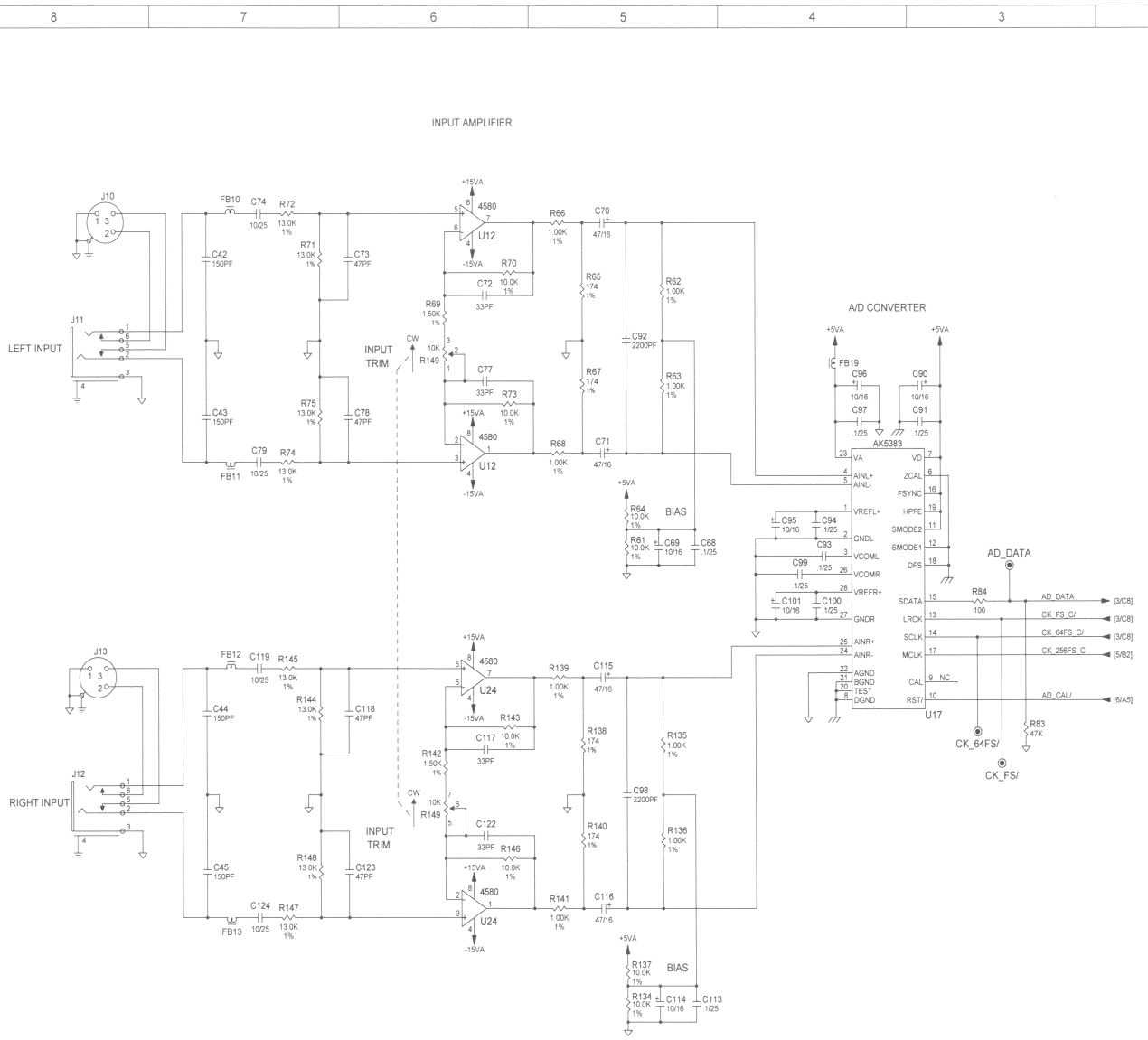
Chapter 8 Schematics and Drawings

Schematics:

060-14128	SCHEM,MAIN BD,MPX500
060-14139	SCHEM,SW#1 BD,MPX500
060-14149	SCHEM,SW#2 BD,MPX500

Drawings:

080-14127	PC,ASSY DWG,MAIN BD,MPX500
080-14138	PC,ASSY DWG,SW#1 BD,MPX500
080-14148	PC,ASSY DWG,SW#2 BD,MPX500
080-14118	ASSY DWG,CHASSIS,MPX500
080-14119	ASSY DWG,SHIPMENT,MPX500



REVISIONS

REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/5/99
		ECM 8/6/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

NOTES

1 UNLESS OTHERWISE INDICATED, RESISTORS ARE 1/10W

2 UNLESS OTHERWISE INDICATED, RESISTORS ARE 5%

3 UNLESS OTHERWISE INDICATED, CAPACITORS ARE UF/V

4 DIGITAL GROUND, ANALOG GROUND, CHASSIS GROUND, CHASSIS SCREW, POWER GROUND

5 [XX/XX] DENOTES [SHEET NUMBER/SECTOR]

6 LAST REFERENCE DESIGNATORS USED: C124, D29, FB19, J20, Q1, R149, SW4, U24, W2, Y2

7 COMPONENTS MARKED WITH * ARE NOT POPULATED.

DOCUMENT CONTROL BLOCK: #060-14128

SHEET NUMBER	REVISION NUMBER
1 OF 7	2
2 OF 7	2
3 OF 7	2
4 OF 7	2
5 OF 7	2
6 OF 7	2
7 OF 7	2

CONTRACT NO.

Lexicon
3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

TITLE: SCHEM, MAIN MPX500 INPUT

SIZE	CODE	NUMBER	REV
B		060-14128	2

FILE NAME: 14128-2.1 SHEET 1 OF 7

9-1-1999_15:08

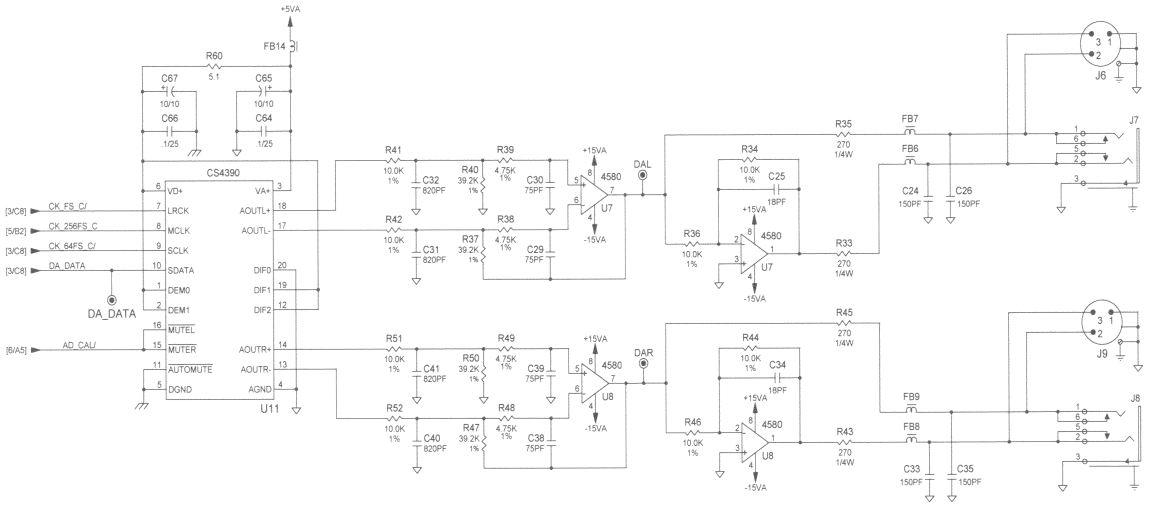
Your Notes:

REVISIONS			
REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/9/99
		ECM 8/5/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

D/A CONVERTER

FILTER / NON-INVERTING DRIVER

INVERTING DRIVER



CONTRACT NO.	Lexicon	3 OAK PARK BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

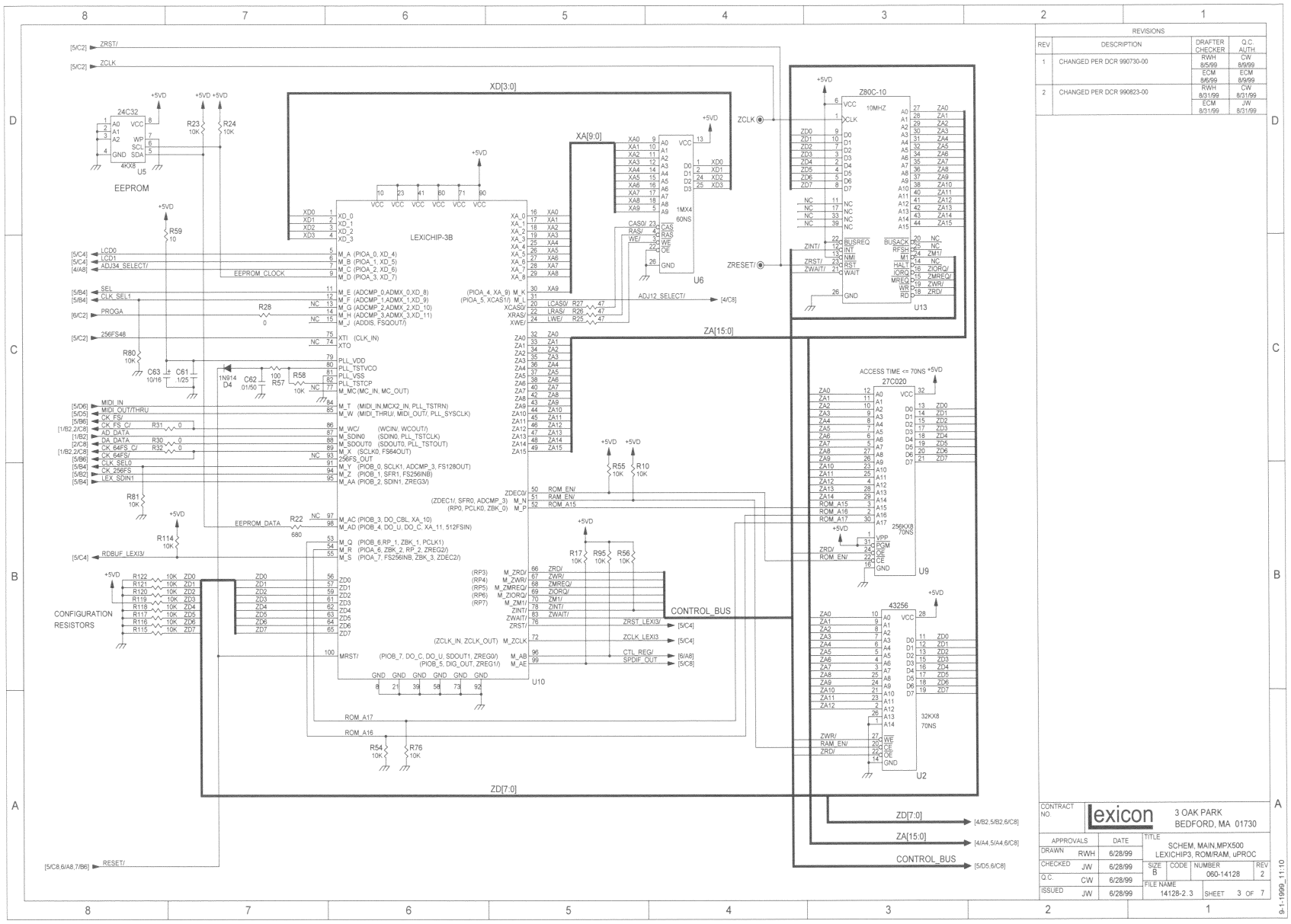
TITLE: SCHEM, MAIN,MPX500 DAC

SIZE	CODE	NUMBER	REV
B		060-14128	2

FILE NAME: 14128-2.2 SHEET 2 OF 7

9-1-1999_11:10

Your Notes:



REVISIONS			
REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/9/99
		ECM 8/6/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

CONTRACT NO.

Lexicon

3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

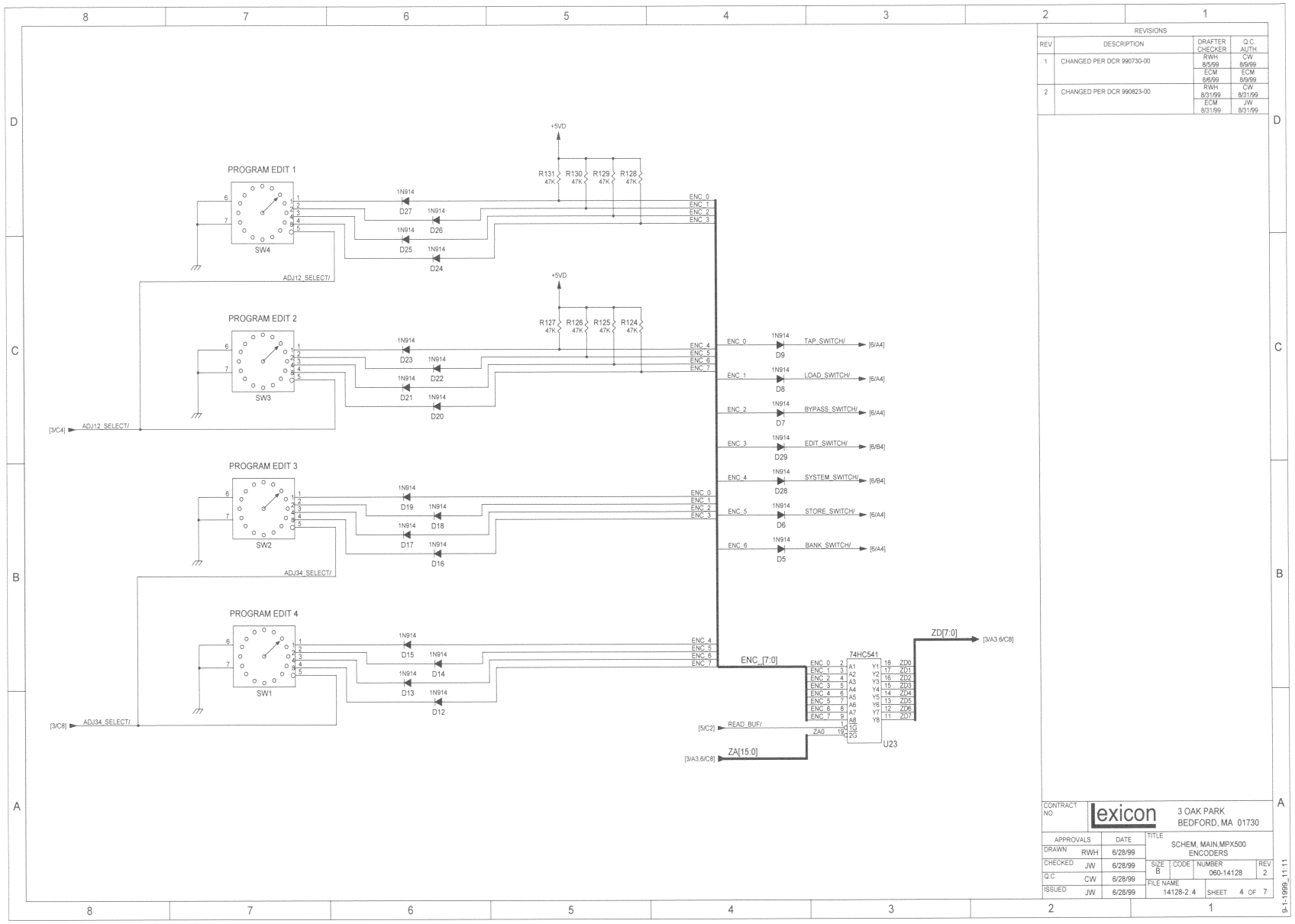
TITLE: SCHEM, MAIN,MPX500
LEXICHIP3, ROM/RAM, uPROC

SIZE	CODE	NUMBER	REV
B		060-14128	2

FILE NAME: 14128-2.3 SHEET 3 OF 7

9-1-1999_11:10

Your Notes:



REVISIONS			
REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/9/99
		ECM 8/6/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

CONTRACT NO.

Lexicon

3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

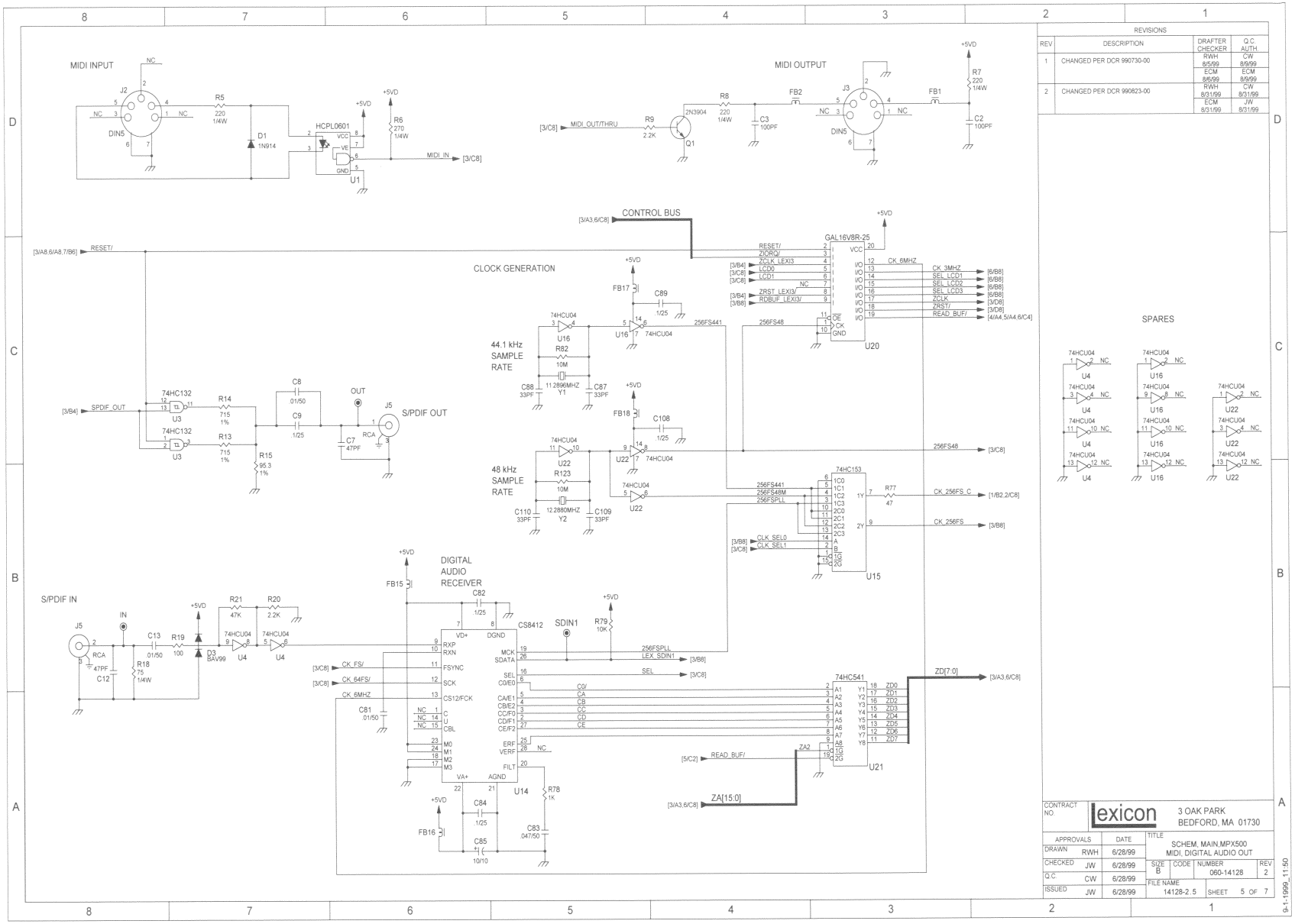
TITLE: SCHEM, MAIN,MPX500 ENCODERS

SIZE	CODE	NUMBER	REV
B		060-14128	2

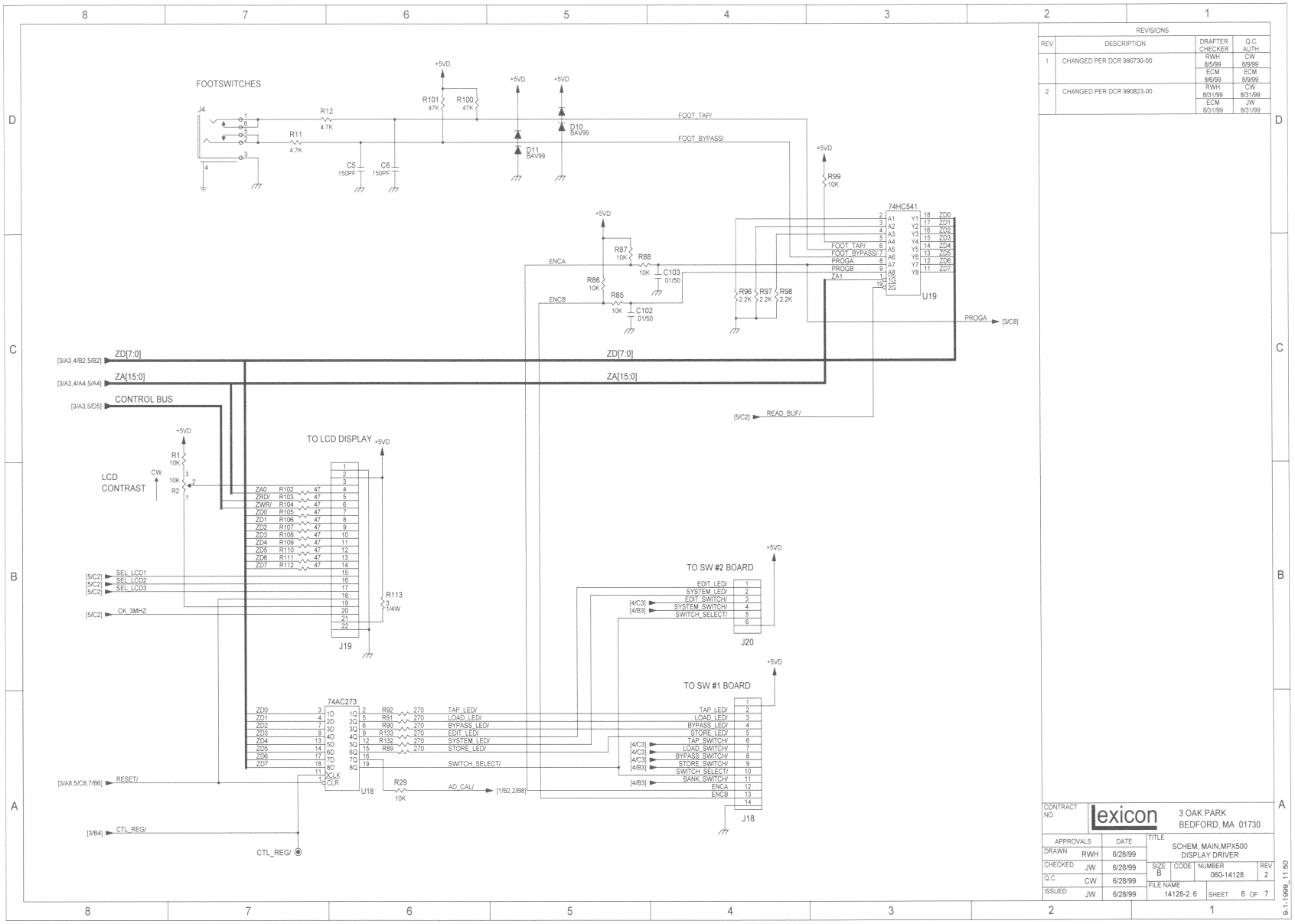
FILE NAME: 14128-2.4 SHEET 4 OF 7

9-1-1999, 11:11

Your Notes:


MIDI INPUT
MIDI OUTPUT
CONTROL BUS
CLOCK GENERATION
44.1 kHz SAMPLE RATE
48 kHz SAMPLE RATE
SPARES
S/PDIF IN
S/PDIF OUT
DIGITAL AUDIO RECEIVER
GAL16V8R-25
CS8412
74HC153
74HC541
74HCU04
DIN5
HCPL0601
MIDI_IN
MIDI_OUT/THRU
RESET/
SPDIF_OUT
CK_6MHZ
CK_3MHZ
CK_256FS_C
CK_256FS
READ_BUF/
ZA[15:0]
ZD[7:0]
SDIN1
LEX_SDIN1
256FS441
256FS48
256FSPLL
CK_FS/
CK_64FS/
SEL
CLK_SEL0
CLK_SEL1
REVISIONS
REV
DESCRIPTION
DRAFTER CHECKER
Q.C. AUTH.
1
CHANGED PER DCR 990730-00
RWH 8/5/99
CW 8/9/99
ECM 8/5/99
ECM 8/9/99
2
CHANGED PER DCR 990823-00
RWH 8/31/99
CW 8/31/99
ECM 8/31/99
JW 9/31/99
CONTRACT NO.
Lexicon
3 OAK PARK
BEDFORD, MA 01730
APPROVALS
DATE
DRAWN RWH 6/28/99
CHECKED JW 6/28/99
Q.C. CW 6/28/99
ISSUED JW 6/28/99
TITLE
SCHEM, MAIN,MPX500
MIDI, DIGITAL AUDIO OUT
SIZE B
CODE
NUMBER 060-14128
REV 2
FILE NAME 14128-2.5
SHEET 5 OF 7
9-1-1999_11:50

Your Notes:



REVISIONS

REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/9/99
		ECM 8/6/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

CONTRACT NO.

Lexicon 3 OAK PARK BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

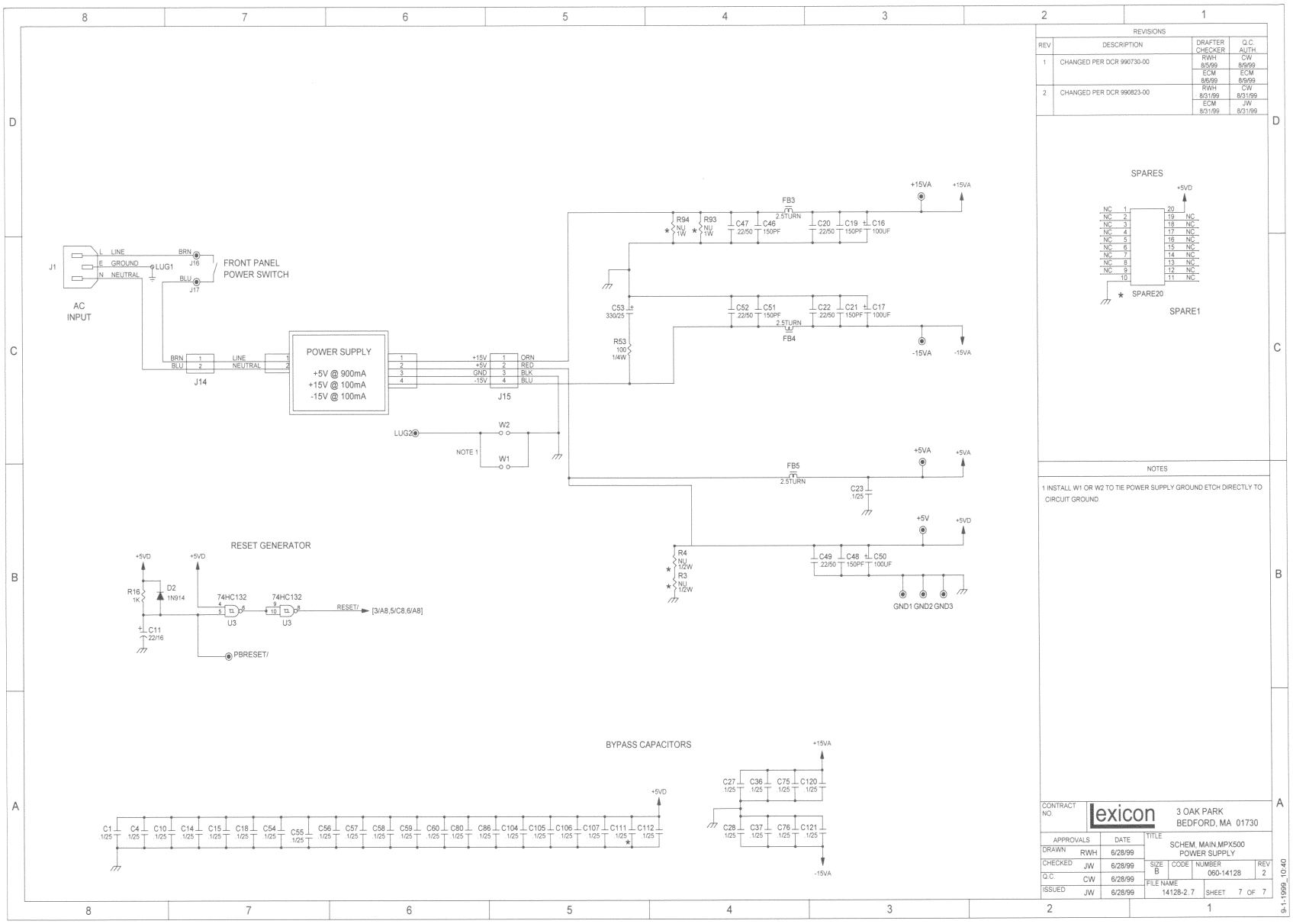
TITLE: SCHEM, MAIN,MPX500 DISPLAY DRIVER

SIZE B | CODE | NUMBER 060-14128 | REV 2

FILE NAME 14128-2.6 | SHEET 6 OF 7

9-1-1999, 11:50

Your Notes:



REVISIONS			
REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.
1	CHANGED PER DCR 990730-00	RWH 8/5/99	CW 8/9/99
		ECM 8/6/99	ECM 8/9/99
2	CHANGED PER DCR 990823-00	RWH 8/31/99	CW 8/31/99
		ECM 8/31/99	JW 8/31/99

NOTES

1 INSTALL W1 OR W2 TO TIE POWER SUPPLY GROUND ETCH DIRECTLY TO CIRCUIT GROUND.

CONTRACT NO.

Lexicon

3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/28/99
CHECKED	JW	6/28/99
Q.C.	CW	6/28/99
ISSUED	JW	6/28/99

TITLE: SCHEM, MAIN,MPX500 POWER SUPPLY

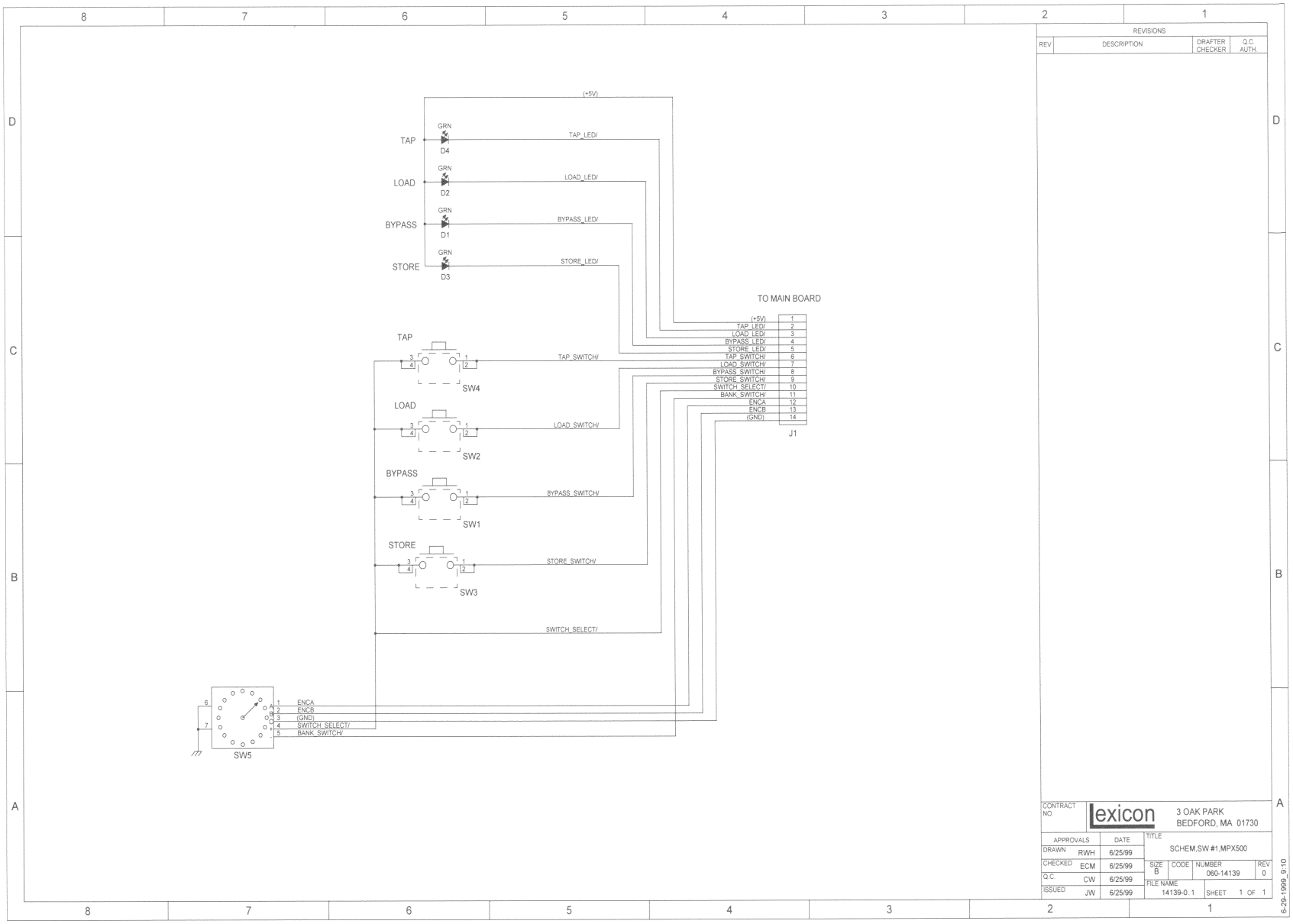
SIZE	CODE	NUMBER	REV
B		060-14128	2

FILE NAME: 14128-2.7

SHEET 7 OF 7

9-1-1999, 10:40

Your Notes:



REVISIONS

REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.

CONTRACT NO.

Lexicon

3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/25/99
CHECKED	ECM	6/25/99
Q.C.	CW	6/25/99
ISSUED	JW	6/25/99

TITLE: SCHEM,SW #1,MPX500

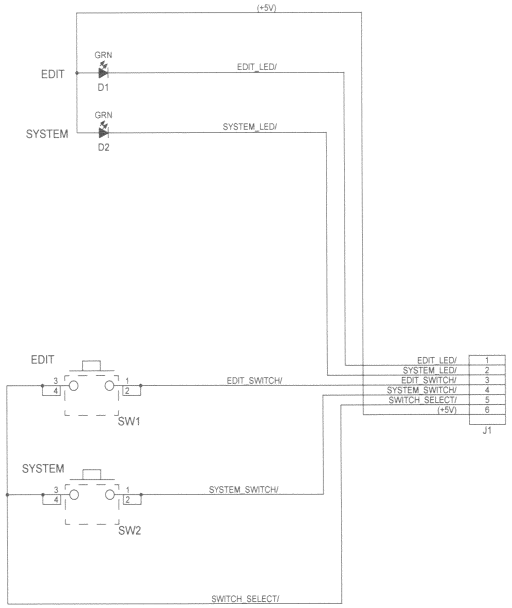
SIZE	CODE	NUMBER	REV
B		060-14139	0

FILE NAME: 14139-0.1

SHEET 1 OF 1

6-29-1999, 9:10

Your Notes:



REVISIONS

REV	DESCRIPTION	DRAFTER CHECKER	Q.C. AUTH.

NOTES

CONTRACT NO.

Lexicon

3 OAK PARK
BEDFORD, MA 01730

APPROVALS		DATE
DRAWN	RWH	6/25/99
CHECKED	ECM	6/25/99
Q.C.	CW	6/25/99
ISSUED	JW	6/25/99

TITLE: SCHEM,SW #2,MPX500

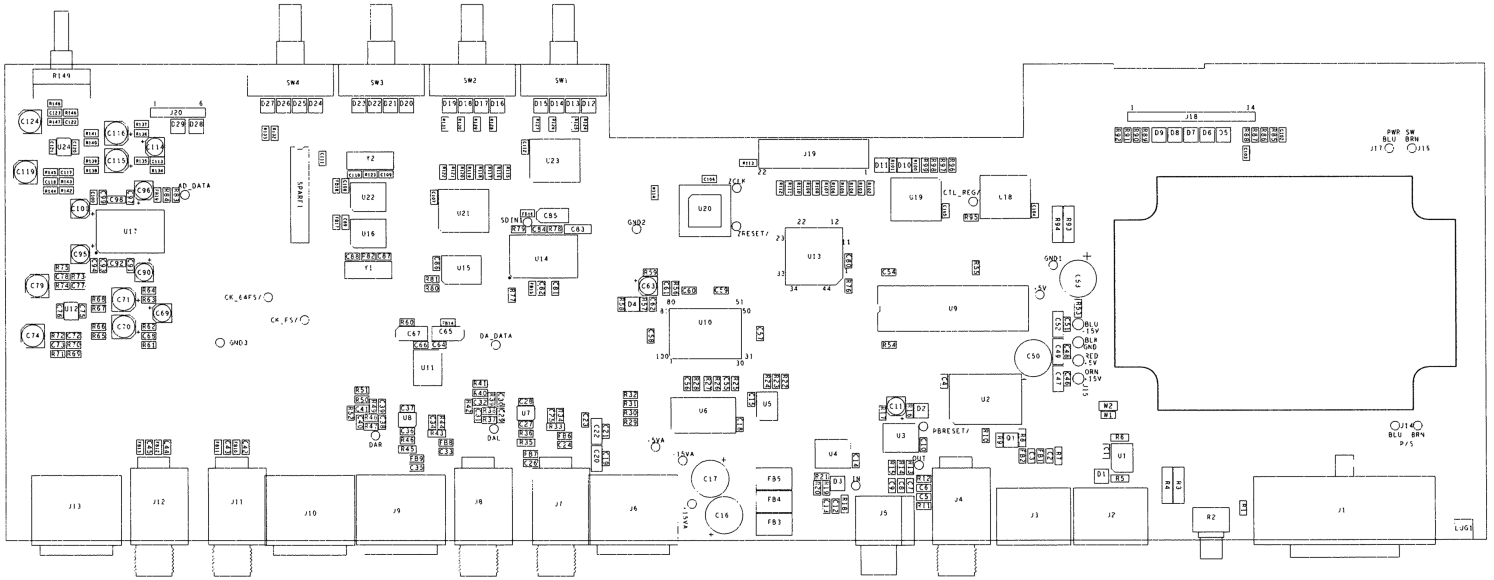
SIZE	CODE	NUMBER	REV
B		060-14149	0

FILE NAME: 14149-0.1

SHEET 1 OF 1

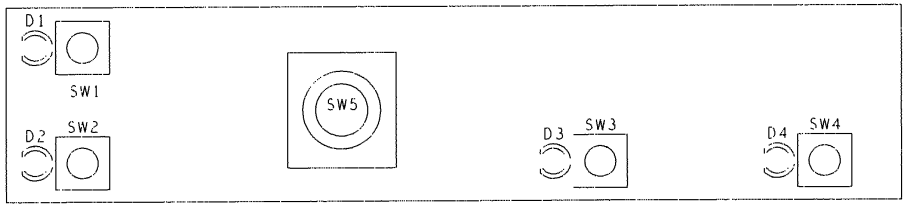
6-29-1999_9:11

Your Notes:



exicon	
PC BD, MAIN, MPX500 COMPONENT LAYOUT	REV 3
SCALE N/A	SHEET 1 OF 1

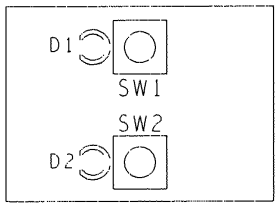
Your Notes:



lexicon

PC BD, SW#1, MPX500 COMPONENT LAYOUT	REV 1
SCALE N/A	SHEET 1 OF 1

Your Notes:



exicon

PC BD, SW#2, MPX500
COMPONENT LAYOUT

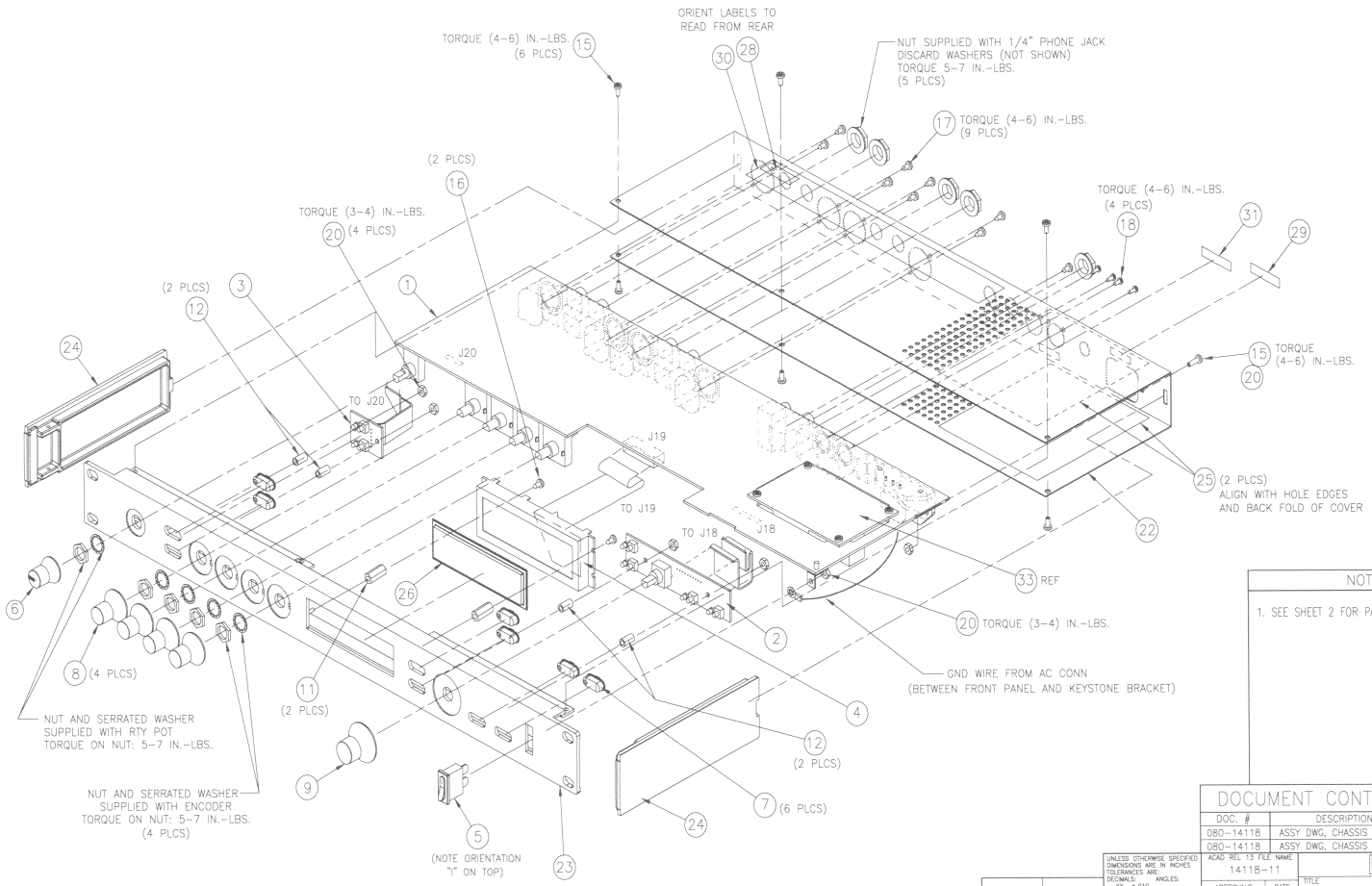
REV
0

SCALE N/A

SHEET 1 OF 1

Your Notes:

REVISIONS			
REV.	DESCRIPTION	DWR/CHKD	Q.C./AUTH
1	REVISE CABLE ROUTING DETAILS PER ECO #991119-00	AN 12/1/99 NB 12/2/99	CW 12/3/99 JW 12/3/99



NOTES

1. SEE SHEET 2 FOR PARTS LIST.

DOCUMENT CONTROL BLOCK

DOC. #	DESCRIPTION	REV.
080-14118	ASSY DWG, CHASSIS SHT 1 OF 2	1
080-14118	ASSY DWG, CHASSIS SHT 2 OF 2	0

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMALS XX ±.010 XXX ±.005 ANGLES ±1/2°	ACAD REL 13 FILE NAME 14118-11
		MATERIAL	APPROVALS / DATE
	MPX500	FINISH	DRAWN JAM 9/15/99
NEXT ASSY	USED ON		CHECKED NB 9/16/99
APPLICATION		DO NOT SCALE DRAWING	Q.C. DW 9/22/99
			ISSUED JW 9/22/99

exicon

TITLE: ASSY DWG, CHASSIS, MPX500

SIZE B | FSCM NO. | DWG. NO. 080-14118 | REV. 1

SCALE N/A | SHEET 1 OF 2

LEXICON, INC.

Your Notes:

ITEM#	PART#	DESCRIPTION	QTY	WHERE USED
1.	023-14129	PL, MAIN BD ASSY	1	
2.	023-14111	PL, SW#1 BD ASSY	1	
3.	023-14112	PL, SW#2 BD ASSY	1	
4.	430-14152	DISP, LCD, 150X32DOTS	1	
5.	454-11095	SWITCH, ROCKER, 1P2T, 6A@250, VERTSLIM	1	
6.	550-11929	KNOB, .69D, 6MM/FL, BLK, LINE	1	
7.	550-11931	BUTTON, .24X.64, BLK, W/LT PIPE	6	
8.	550-14168	KNOB, .85D, 6MM/FL, BLK	4	
9.	550-14169	KNOB, 1.05D, 6MM/FL, BLK	1	
10.				
11.	630-14114	SPCR, 4-40 X 7/16, 3/16 HEX, NYLON	2	DISPLAY TO FRONT PANEL
12.	635-12831	SPCR, .14 ID X .250D X .375L, AL	4	SW BDS TO FRONT PANEL
13.				
14.				
15.	640-02812	SCRW, 4-40X3/8, PNH, PH, BZ	7	COVER TO SIDE & FRONT PANELS (6), AC CONN (1)
16.	640-14115	SCRW, 4-40X3/16, PNH, PH, NYLON	2	DISPLAY TO FRONT PANEL
17.	641-11466	SCRW, TAP, AB, #4X3/8, PNH, PH, BZ, TRI	9	XLR & RCA CONN TO COVER
18.	641-12759	SCRW, TAP, AB, #2X1/4, PNH, PH, BZ	4	DIN CONN TO COVER
19.				
20.	643-01732	NUT, 4-40, KEP, ZN	6	SW BDS TO FRONT PANEL (4), MAIN BD TO FRONT PANEL (1), AC CONN (1)
21.				
22.	700-14164	COVER, MPX500	1	
23.	702-14160	PANEL, FRONT, MPX500	1	
24.	702-14163	PANEL, SIDE, 1.71 X 5.42	2	
25.	702-14177	COVER, PROTECTIVE, PS, 4.10 X 4.10	2	COVER, INSIDE
26.	703-14167	LENS, 3.37 X .87, CLR	1	
27.				
28.	740-08558	LABEL, TUV CERTIFIED, BAYERN	1	COVER, TOP
29.	740-09538	LABEL, S/N, CHASSIS, PRINTED	1	COVER, REAR
30.	740-11482	LABEL, WARN/APP, FCC/C-UL/CE, PRO	1	COVER, TOP
31.	740-13573	LABEL, MFR ID, .9 X .25, SILVER	1	COVER, REAR
32.				
33.	750-14151	PWR SUP, +5V/+15V/-15V, 7.5W	REF	
34.				
35.				

REVISIONS

REV.	DESCRIPTION	DWR/CHKD	Q.C./AUTH

NOTES

1. PART NUMBER LISTING IS FOR REFERENCE ONLY AND DOES NOT SUPERSEDE THE BOM: #022-14109

NEXT ASSY	MPX500
APPLICATION	USED ON

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS: ANGLES:
XX ±.010 ±1/2°
XXX ±.005
MATERIAL
FINISH
DO NOT SCALE DRAWING

ACAD REL 13 FILE NAME: 14118-02

APPROVALS	DATE
DRAWN AN	9/15/99
CHECKED NB	9/16/99
Q.C. DW	9/22/99
ISSUED JW	9/22/99

lexicon

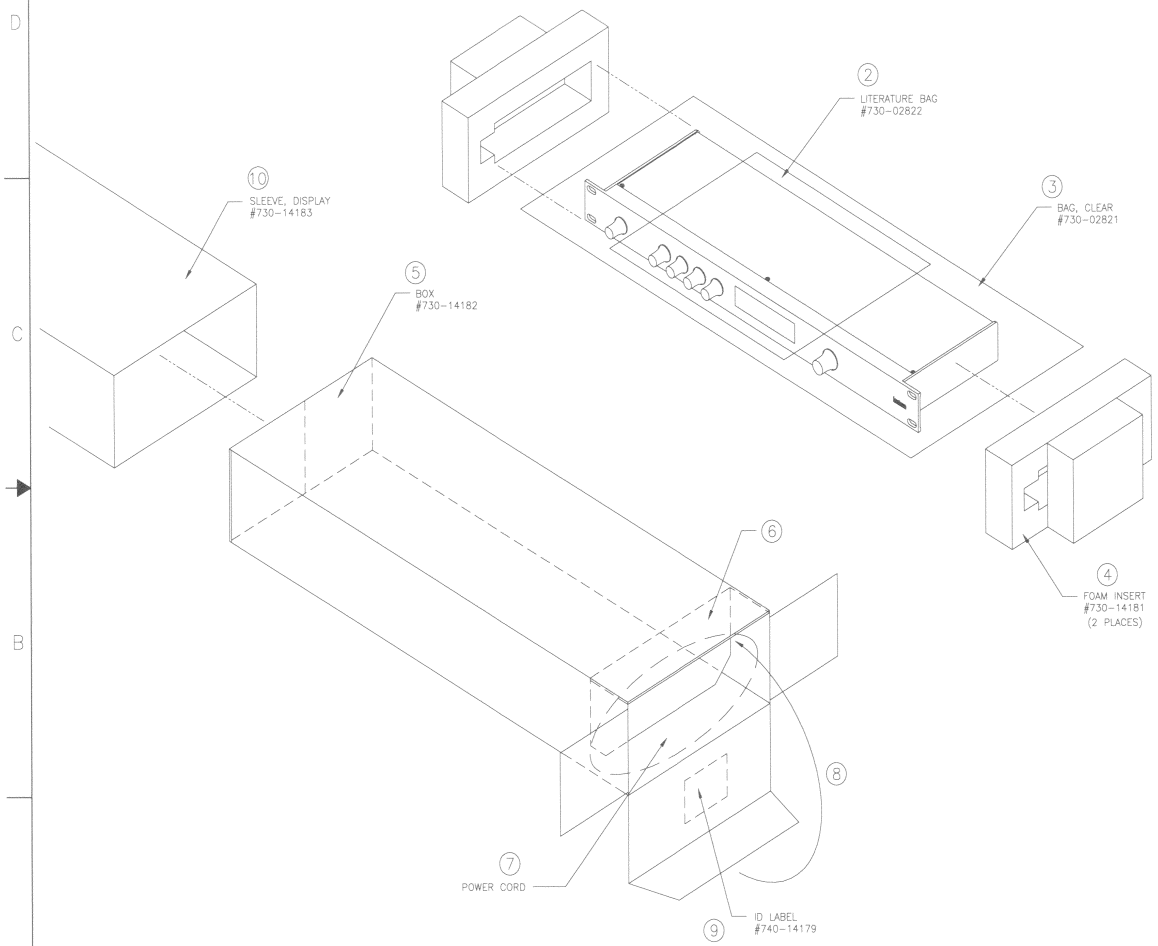
TITLE: ASSY DWG, CHASSIS, MPX500

SIZE	FSCM NO.	DWG. NO.	REV.
B		080-14118	0

SCALE N/A SHEET 2 OF 2

LEXICON, INC.

Your Notes:



REVISIONS			
REV.	DESCRIPTION	DWR/CHKD	Q.C./AUTH
1	CHG LITERATURE BAG P/N PER ECO #991119-00	AN 11/23/99 NB 12/2/99	CW 12/3/99 JW 12/3/99

NOTES

1. PART NUMBER LISTING IS FOR REFERENCE ONLY AND DOES NOT SUPERSEDE THE BILL OF MATERIAL #022-14108.
2. PUT LITERATURE IN BAG. REFER TO BOM FOR FOR LIST AND SEQUENCE OF LATEST DOCUMENTATION PACKAGE. TAPE BAG.
3. PUT UNIT (WITH LITERATURE BAG ON TOP) IN BAG, FOLD AND SEAL BAG SO ALL CREASES AND SECURING TAPE ARE ON THE BOTTOM OF THE UNIT.
4. PLACE FOAM INSERTS ON ENDS OF SEALED UNIT AS SHOWN.
5. FOLD UP AND TAPE END OF BOX WITH STRAIGHT RECTANGULAR FLAPS.
6. SLIDE UNIT INTO BOX. FOLD DOUBLE SCORED BACK INTO BOX AGAINST THE FOAM INSERT.
7. PLACE APPROPRIATE POWER CORD IN THE END CAVITY. SEE BOM FOR PART NUMBER.
8. FOLD IN SMALL SIDE FLAPS AND CLOSE END FLAP. TAPE.
9. PLACE ID LABEL ON END FLAP.
10. SLIDE DISPLAY SLEEVE OVER BOX AND TAPE ON BOTH ENDS. USE CLEAR TAPE.

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XX +/-.015 .XXX +/-.005	ACAD REL 13 FILE NAME: 14119-1
		MATERIAL	APPROVALS / DATE
	MPX500	FINISH	DRAWN AN 9/14/99
NEXT ASSY	USED ON		CHECKED NB 9/16/99
APPLICATION		DO NOT SCALE DRAWING	Q.C. CW 9/16/99
			ISSUED JW 9/16/99

lexicon

TITLE: ASSY DWG, SHIPMENT, MPX500

SIZE B | FSCM NO. | DWG. NO. 080-14119 | REV. 1

SCALE N/A | SHEET 1 OF 1

LEXICON, INC.

Your Notes:

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