



Logitek



BRIGHT-VU

LED Audio Level Display

Operation & Service Manual

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Bright-VU LED Meter INSTRUCTION MANUAL

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SECTION 1 — GENERAL INFORMATION

1-1 General Description

The Logitek Bright-VU is a bargraph type audio level meter featuring two LED bargraphs. Average level is always shown and is displayed as a solid bar. PPM is displayed as a single dot. The meters accept either analog audio or serial digital inputs and are available in three 19 inch rack mount configurations, all with internal power supplies.

1-2 Electrical Specifications

Bargraphs per meter: Two

Indicators per bargraph: 20

Scale Range: -35 dB to +18 dB

0 dB Reference Point:

Analog Input adjustable -20 to +10 dBu
Digital Input -19 dB full scale

Response Time:

VU Mode 300 mSec / 20 dB attack
300 mSec / 20dB release
PPM Mode 0 mSec attack
2.8 Sec / 24 dB release

Frequency Response: $\pm .1$ dB (20 - 20K hz)

Analog Input:

Sensitivity -10 to +20 dBu for full scale
rear panel adjustable
Overload Level +24 dBm
Impedance 40K Ohm balanced
20K Ohm unbalanced
CMRR -80 dBu
Connector Female 3-pin XLR

Digital Input:

Codes AES/EBU, S/PDIF
Impedance 110 Ohm balanced
75 Ohm unbalanced
Loop-through 2200 Ohm balanced
Termination transformer balanced
Connector Female 3-pin XLR (IN)
Male 3-pin XLR (OUT)

AC Line Input Voltage:

50-60 Hz 105-129 VAC or
(switch settable) 220-240 VAC

Power Requirement:

BV2-(all) & BDT-(all) 5 watts
BV4-(all) 10 watts
BV6-(all) 15 watts

Dimensions:

1RU enclosure 19"W x 7"D x 1 $\frac{3}{4}$ "H
Desktop case 6" W x 6 $\frac{1}{4}$ "D x 2 $\frac{1}{2}$ "H

1-3 Instrument Identification

The Bright-VU is identified by a model number and a three or four digit serial number. The model number and serial number appear on a label on the back of the unit near the power cord. All correspondence to your Logitek dealer or to the Logitek factory should refer to the model number and serial number.

1-4 Where to find help

Logitek customer service personnel are available to help with any questions, comments or problems you might have with the Bright-VU meter, both during and after the warranty period. Our hours of operation are 8AM to 5PM central time. We may be contacted in one of the following ways:

By Phone: 877-231-5870 (U.S.A. & Canada)
or 713-664-4470

By Fax: 713-664-4479

By E-mail: help@logitekaudio.com

By Mail: Logitek Electronic Systems, Inc.
5622 Edgemoor Drive
Houston, TX 77081
USA

SECTION 2 — PREPARATION FOR USE

2-1 Initial Inspection

Check the shipping carton carefully for external damage. If the carton shows evidence of abuse, ask the carrier's agent to be present when the unit is unpacked. Carefully unpack the unit to avoid damaging the equipment through the use of careless procedures. Inspect all equipment for damage immediately after unpacking. Bent and broken parts, dents, and scratches should be noted. If damage is found, refer to paragraph 2-2 for recommended claim procedures. Keep all packing material for possible future use.

2-2 Claims

If the unit has been damaged, notify the carrier immediately. File a claim with the carrier and advise Logitek of such action to arrange for repair or replacement without waiting for a claim to be settled with the carrier.

2-3 Repacking for Shipment

If the unit must be returned to Logitek, attach a letter to it showing the owner's name and address. A description of the necessary service should be included in the letter. The original shipping carton and packaging materials should be used for reshipment if possible. Use FRAGILE labels on each surface. Return the unit freight prepaid. Be sure to insure the unit for its full value. The unit will be repaired promptly and returned freight prepaid.

2-4 Installation

The Bright-VU models are designed to be mounted in a standard 19" equipment rack by using the four mounting holes in the corners of the front panel. Plastic washers should be used to keep the mounting screws from marring the front panel finish.

While flow-through ventilation is not necessary, the units should not be mounted directly above equipment which produces significant heat, such as equipment using vacuum tubes. The unit should never be operated if the ambient temperature is above 55 degrees C (131 degrees F).

2-5 Connecting Mains Power

Connect the meter to the power mains with the enclosed power cord. The unit is factory set for 115VAC operation but 230VAC operation can be selected via a slide switch located next to the power transformer inside the unit. To gain access to the voltage select switch, remove the enclosure top cover. The switch is located adjacent to the large power transformer. The mains connector is an IEC standard power entry module and may be used with any IEC type power cord of 15 amps or less.

2-6 Input Selection on Dual Input Models

If the digital receiver can lock onto an input signal then the meter will display that signal whether it contains errors or not. If no signal is connected to the digital input or the data rate is out of the receiver's capture range, then the meter will display the analog signal. This happens even if nothing is connected to the analog inputs.

2-7 Connecting Digital Input Models

The Bright-VU accepts AES/EBU or S/PDIF serial data at sample rates of 30,000 to 50,000 samples per second via a female XLR connector on the rear panel. The input is also wired directly to the male XLR connector on the back panel for use in loop-through mode. The loop-through connector provides a convenient way to daisy-chain several pieces of equipment off of one digital output. Loop-through works well with AES/EBU signals but should be limited to 10 feet with S/PDIF signals and cables.

S/PDIF signals using RCA type plugs may be connected to the input using an RCA to XLR adapter. Coax cables using BNC connectors can be connected to the input using a BNC to XLR adapter. Both of these are available from Logitek.

AES/EBU Connection

Pin 1:	Shield
Pin 2:	Signal +
Pin 3:	Signal -

Pin-1 and the shell of each XLR is attached directly to the chassis at the connector. These shielding components do not share a ground path with any of the internal circuitry. One-end-only shield connections are *NOT* recommended when using digital input models.

It is also important to set the two input load switches located between the two XLR connectors.

Sw1	Sw2	Ohms	Use
Up	Up	2200	Loop-through mode
Up	Dn	110	Balanced twisted pair (XLR)
Dn	Up	75	Unbalanced coax (RCA & BNC)
Dn	Dn	44	do NOT use this setting

The Bright-VU is set so that full scale (maximum code) will light the top bargraph LED (+18 dB).

SECTION 3 — OPERATING INSTRUCTIONS

3-1 Bargraph Description

The Bright-VU meter display contains two multi-LED bargraph displays mounted one above the other. The top bar shows left channel and the bottom bar shows right channel. The 20 segments are arranged in four color groups. The -35 to -1 dB segments are green, the 0 dB segment is yellow, the +1 to +3 segments are orange and the +6 to +18 dB segments are red. Average (VU) levels are shown as a solid bar while peak (PPM) levels are shown as a single dot.

3-2 Display Ballistics

In the PPM mode, the display has essentially 0 attack time and a 2.8 second per 24 dB release time. In average mode, the display has an attack and release time of approximately 300 milliseconds per 20 dB. These ballistics conform the international standards with the exception that the Bright-VU peak attack time is slightly faster.

3-3 Using Alignment Tones

The Bright-VU always displays the actual measured values of the input signal. If a constant level sine wave is applied to the meter, the PPM dot will be about 3 dB above the VU bar. This is due to the difference between the average and peak value of a sine wave. The size of the VU to PPM difference is a function of signal wave shape and the only signal that has the same VU and PPM reading is a square wave.

3-4 User Maintenance

The chassis and display windows of the unit may be cleaned using a mild detergent or isopropyl alcohol and a soft cloth. Do *NOT* use abrasive cleaners or aromatic solvents to clean the Bright-VU meter units.

******* WARNING *******

The inside of the Bright-VU contains no controls or user serviceable parts. The cover should only be removed by competent technical personnel capable of servicing this type of equipment. Hazardous voltages exist on the underside of some circuit cards.

Logitek will be happy to provide further information for servicing the unit. Please contact the factory or your Logitek dealer for further information.

3-5 Resetting the Program

The Bright-VU contains software that executes on a programmable DSP integrated circuit. If the processor memory becomes corrupted, the meter may function incorrectly or fail to operate altogether. In most cases, an independent watchdog circuit will notice that the meter is working incorrectly and restart the system.

The processor can be reset manually by turning the power off for fifteen seconds and then back on again.

SECTION 4 — SERVICING

4-1 General Information

The Bright-VU is designed to need a minimum of maintenance for long trouble-free operation. Should repair be necessary, the technician should first read the information in the manual concerning the circuits in question and should follow proper procedures for testing and replacing semiconductors. Logitek engineers are readily available at the factory to provide technical assistance both during and after the warranty period.

***** **WARNING** *****

The inside of the Bright-VU contains no controls or user serviceable parts. The cover should only be removed by competent technical personnel capable of servicing this type of equipment. Hazardous voltages exist on the underside of some circuit cards.

4-2 Fuse

The primary winding of the power transformer is fused with a ½ amp slow-blow 20mm fuse housed in a fuse holder in a slide-out drawer under the power cord on the rear panel of the unit. It should only be replaced with fuses of the same type and current rating. The power cord must be unplugged from the rear panel to gain access to the fuse holder.

***** **WARNING** *****

Do **NOT** replace the fuse without first disconnecting the meter's power cord from the wall socket, as dangerous voltages are present which may cause electrical shock. Always use fuses of the same value and type as specified in this manual. Do **NOT** use fuses of a higher value than those specified, as a shock hazard and a fire hazard may result.

A blown fuse is most often, although not always, a symptom of another failure. Related circuitry should always be carefully examined after any fuse failure, especially if a replacement fuse also blows.

4-3 Handling of CMOS Integrated Circuits

All logic components in the Bright-VU meter are CMOS type integrated circuits. Even though all circuits have built-in static discharge protection, special care must be taken in the handling of these devices, particularly in dry environments.

***** **IMPORTANT NOTE** *****

Do **NOT** remove or handle CMOS integrated circuits except in a grounded environment which is free of the risk of static electricity. Store such circuits on conductive foam or in anti-static containers. Do **NOT** store on styrofoam or other plastic sheets. Improper handling may damage these devices.

4-4 Access to Circuit Cards

The internal components of the meter are accessed by removing the eight screws that attach the top cover and removing the cover.

4-5 DSP Control Card

Filtered +9 VDC from power connector P3 is fed to the +5 VDC regulator IC5 via connector P4. +9 VDC as well as -9 VDC from P3 is also passed to the input cards via connectors P1 and P2. The +5 VDC output of IC5 is clamped against over voltage and voltage reversal by zener diode D1. Distributed power is filtered by C1, C2, C3, C4 and C5. In addition to powering all circuits on this card, IC5 also supplies +5 VDC to the input and display cards via connectors P1, P2, P5 and P6.

On power up, the DSP is kept in reset by IC1 until the power has stabilized, ensuring a good power on reset. IC1 also contains a watchdog timer that will reset the DSP if its ST pin is not taken low at least once every 150 mSec. This pin is normally pulsed low every 5 mSec by a DSP write to address 0.

The DSP (IC4) is clocked by a 12.288 MHZ crystal oscillator consisting of Y1, C6, C7 and an IC4 internal driver. IC4, pin43 is a buffered output of the oscillator and is used as the master clock for the analog to digital converters on the analog input cards.

The first thing the DSP (IC4) does after reset is copy its program from EEPROM IC3 to its internal memory. Note that the 8-bit data bus from the EEPROM is connected to the middle byte of the DSP's 24-bit data port.

Address decoder IC2 is used to reset the watchdog timer IC1 and supply the serial bit clock and load signals to the LED drivers on the display cards.

The front panel PPM/VU slide switches are connected directly to the low byte of the DSP address port.

Serial data is sent synchronously (data, clock, load) to the LED driver chips via display connectors P5 and P6 in 16-bit strings. Data is placed on the top bit of the DSP data port and clocked into the display drivers via a write to address decoder IC2. Other writes to IC2 will load the 16-bit strings into the left or right side display driver.

Two channel audio data is fed synchronously (data,clock,frame sync) to serial ports on the DSP via input connectors P1 and P2. If the control card is only driving one display then the DSP IC4 will only have one serial port which will be connected to P1. In this case only left side connectors P1 and P6 will be active.

4-6 Analog Input Card

The audio from the left input XLR connector J1 is connected to a RF lowpass filter formed by R1, R2, C1 and C2. The resistors also form a -9 dB pad with the input impedance of balanced receiver IC1. IC1 provides an additional -6 dB pad between its input and output. These pads allow +20 dBu input signals to be handled by the +/- 5 volt supply rails. Signal gain is adjusted via trimpot R7 which is the feedback resistor around gain stage IC3a.

Signal from IC3a is fed through anti-alias filter R9, C5 and DC isolated by C8 before connecting to the left input of the sigma delta analog to digital converter. Right channel connects to the converter via similar circuitry.

The 12.288 MHZ master clock input to the ADC is generated by a crystal oscillator located on the DSP control card. Combined left and right audio data is sent synchronously (data, clock, frame sync) to the DSP in 64-bit strings via connector P3.

IC5 and IC6 supply low noise regulated +/- 5 VDC to the analog portions of the circuit. The digital part of the data converter gets its +5 VDC from the DSP control card.

4-7 Digital Input Card

Serial digital audio in the AES/EBU or S/PDIF format enters the card via XLR connector J1 and is directly connected to the output connector P2. Note that no buffering is applied to the loop through output.

The input data signal is connected to pulse transformer T1 via DC blocking capacitor C2. The output of T1 is loaded with R1, R2 or R3, depending on the load required, and connected to data receiver IC1. C1 and R4 from a loop filter used by IC1 to recover the embedded clock from the coded input signal. IC1 separates the audio data, channel data and clock from the input signal. The audio is sent to the DSP in 64-bit strings via connector P3.

IC2 creates a low noise +5VDC for use by the analog front end of IC1. The voltage is stabilized by C6 & C3 and is clamped against over or reverse voltage by D1.

4-8 LED Display Card

Regulated +5 VDC from J1 is stabilized by C1, C2 and connected to LED display driver IC1. IC1 controls the 40 display LEDs by scanning them in a six by eight matrix. Segment lines are current controlled and connected to the LED anodes. Digit lines connect to the LED cathodes. Scanning is accomplished by taking each digit line low one at a time and sourcing current

from the segment lines for whichever of the 8 LEDs in a digit group need to be lit.

The display driver accepts synchronous serial data (clock, data, load) from the DSP on the control card in 16 bit strings composed of an address byte and a data byte. About once a second the DSP sends a complete set of setup codes for the display driver. If the display card is plugged in while the meter is running, it will remain blank for a moment until these codes are received.

4-9 Power Supply

Each Bright-VU contains a ground isolated and filtered step-down power supply to create the necessary operating voltages. This supply is located on a PCB on the right side of the meter enclosure.

Mains AC from the power entry module J2 is fed through fuse F1, located in a drawer under the power cord in J2, to J1 on supply card LG-253. J1 feeds voltage selection switch S1 which connects the dual primaries of transformer T1 in series for 230 VAC operation or parallel for 115VAC operation. The dual secondaries of T1 are wired in parallel and loaded with a full-wave bridge rectifier RT1. The DC output of RT1 is filtered by capacitors C1 and C2 and fed to the red and green output pads. The voltage should be between 8 to 10 VDC with less than .5 volt of ripple.

Analog input models will also have a charge pump consisting of IC1 and C3 that feeds filter C4 and the black output pads. The voltage should be -8 to -10 VDC with less than .2 volt of ripple.

Jumpers soldered to the output pads feed power to one or two DSP control cards.

******* WARNING *******

Dangerous voltages from the AC mains are present on the bottom of the power supply card. Always disconnect the AC power cord when servicing this circuit board. Always completely reinstall this board before reconnecting the power cord.

4-10 ADC Input Card

The audio from the left input 1/4" phone connector J2 is connected to a RF lowpass filter formed by R10, R11, C3 and C4. The resistors also form a -9 dB pad with the input impedance of the balanced receiver IC4. IC4 provides an additional -6 dB pad between its input and output. These pads allow +20 dBu input signals to be handled by the +/- 5 volt supply rails. The output of IC4 is unity gain inverted by op-amp IC2b and fed back to the reference input of IC4. This enables IC4 to present an identical resistive load on its two input pins. Input gain is adjusted via trimpot R9 which is the feedback resistor around gain stage IC1b.

***** **IMPORTANT** *****

Only replace IC2 with an op-amp which is slower than the SSM2143 such as the TL072 used here. A faster op-amp like the NE5532 will cause the output of IC4 to oscillate.

Signal from IC1b is fed through anti-alias filter R14 C8 and DC isolated by C11 before connecting to the left input of the sigma delta analog to digital converter IC7. The right channel connects to the converter via similar circuitry.

The 12.288 MHZ master clock input to the ADC is generated by a crystal oscillator located on the DSP control card. Combined left and right audio data is sent synchronously (data, clock, frame sync) to the DSP in 64-bit strings via connector P3. The reset signal from the DSP control card is also connected to the ADC. The DSP activates the reset once a day which causes the ADC to perform a self calibration routine for about half a second. If the meter has undergone a substantial temperature change, it may generate noise up to -70 dBFS until it undergoes a calibration cycle

The three supply voltages from P3 are EMI isolated by ferrite beads FR1,FR2 and FR3 before connecting to the other circuitry. IC5 and IC6 supply low noise regulated +/- 5 VDC to the analog portions of the circuit. The digital part of the data converter gets its +5 VDC from the DSP control card.

SECTION 5 — REPLACEMENT PARTS LIST

All replacement parts are stocked in depth at the Logitek factory. Most are also available through local electronic parts distributors. For your convenience in purchasing replacement parts locally, we include the following parts list.

All Logitek part numbers consist of a two-letter manufacturer code followed by that manufacturer's standard part number for the item. A list of manufacturers, arranged alphabetically by manufacturer code, follows this parts list in Section 7.

All resistors are 1/4 watt, +/- 5% tolerance unless otherwise noted.

SYMBOL	DESCRIPTION	LOGITEK PART NUMBER
5-1 <u>DSP Control Card</u>		
Capacitors		
C1,2	10uf/25V tantalum	AV-TAP106K025HSB
C3-5	.1uf/50V SMD ceramic	NC-NMC1206Z5U104M50T
C6	25pf/1000V ceramic	CE-DD-250
C7	15pf/1000V ceramic	CE-DD-150
Diodes		
D1	5.6V zener 1 watt	MO-1N4734A
Connectors		
P1,2	10-pin dual row header	PN-051-010-153
P3	3-pin large header - locking	PN-MLSS156-3A
P4	3-pin header	PN-MFSS100-3A
P5,6	10-pin dual row header	PN-051-010-153
4 pcs.	10-pin dual row socket	PN-050-010-455
1 pc.	3-pin large socket	PN-CE156F20-3A
1 pc.	3-pin socket (on regulator)	PN-CE100F28-3A
Crystals		
Y1	12.288 MHz	CT-MP122
Integrated Circuits		
IC1	uP monitor	MM-MAX1232CPA
IC2	3 to 8 decoder	MO-SN74HC138N
IC3	EEPROM 8k x 8 150ns	CA-CAT28C64BN-15
IC4	DSP 16-bit (drives 2 displays)	AD-ADSP-2115-KP40
	DSP 16-bit (drives 1 display)	AD-ADSP-2105-KP40
IC5	+5 VDC regulator	MO-MC7805CT
1 pc.	8-pin dip socket	EM-100-083-10-1003
1 pc.	16-pin dip socket	EM-100-163-10-1003
1 pc.	32-pin PLCC	EM-150-032-11-02
1 pc.	68-pin PLCC	EM-150-068-11-02
Resistors		
R1	10K	
R2	12K 2% 5 position bussed	CT-770-61-R123
1 pc.	Circuit card	LG-270 Bright-VU Control
5-2 <u>Analog Input Card</u>		
Capacitors		
C1-4	75pf/1000V ceramic	CE-DD-750
C5,6	2200pf/50V NPO SMD ceramic	NC-NMC1206NPO222K50TR
C7-12	1uf/35V tantalum	AV-TAP105K035HSB
C13-15	.1uf/50V SMD ceramic	NC-NMC1206Z5U104M50T
C16-19	470pf/ SMD	AV-12061A471JATMA
C20-23	4.7uf/25V tantalum	AV-TAP475K025CCS
C24-26	.01uf/ SMD	AV-12065E103MATMA

SYMBOL	DESCRIPTION	LOGITEK PART NUMBER
	Diodes	
D1,2	5.6V zener 1 watt	MO-1N4734A
	Connectors	
J1,2	Female XLR pc	NT-NC3FK-H
P3	10-pin dual row header	PN-051-010-153
J3	10-pin dual row socket	PN-050-010-455
	Integrated Circuits	
IC1,2	Balanced line receiver	AD-SSM2143P
IC3	Quiet op amp	AD-OP275GP
IC4	ADC 16-bit stereo	AD-AD1877JR
IC5	-5 VDC regulator 100ma	MO-MC79L05ACP
IC6	+5 VDC regulator 100ma	MO-MC78L05ACP
3 pc.	8-pin dip socket	EM-100-083-10-1003
	Resistors	
R1-4	21K, .1%	DL-RNC55H2102BS
R5,6	4220, 1%	
R7,8	50K multi-turn trim	MP-CT9X503
R9,10	300	
1 pc.	Circuit card	LG-271A Bright-VU Analog Input
5-3 Digital Input Card		
	Capacitors	
C1	.047uf/50V	CE-CW-20C473K
C2-4	.1uf/50V SMD ceramic	NC-NMC1206Z5U104M50T
C5,6	4.7uf/25V tantalum	AV-TAP475K025CCS
C7	1uf/35V tantalum	AV-TAP105K035HSB
	Diodes	
D1	5.6V zener 1 watt	MO-1N4734A
	Connectors	
J1	Female XLR pc	NT-NC3FK-H
J2	Male XLR pc	NT-NC3MK-H
P3	10-pin dual row header	PN-051-010-153
J3	10-pin dual row socket	PN-050-010-455
	Integrated Circuits	
IC1	AES/EBU receiver	CS-CS8412-CS
IC2	+5 VDC regulator 100ma	MO-MC78L05ACP
	Resistors	
R1	2200	
R2	110	
R3	75	
R4	1000	
	Switches	
SW1,2	2 position SPST dip lever	CT-194-2MST
	Transformers	
T1	AES/EBU	SS-67129600
1 pc.	Circuit card	LG-272 Bright-VU Digital Input

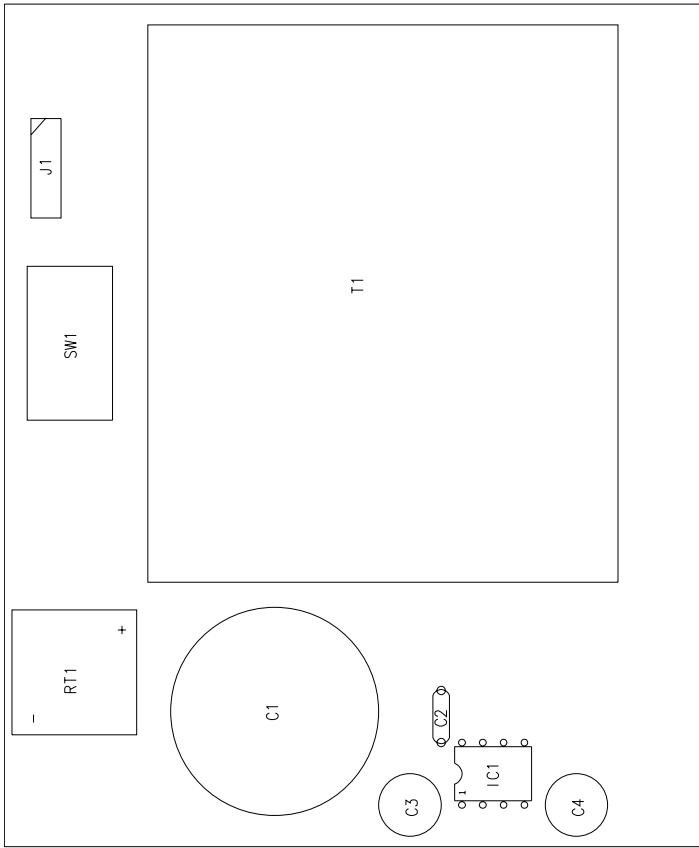
<u>SYMBOL</u>	<u>DESCRIPTION</u>	<u>LOGITEK PART NUMBER</u>
<u>5-4 LED Display Card</u>		
	Capacitors	
C1	.1uf/50V SMD ceramic	NC-NMC1206Z5U104M50T
C2	10uf/25V tantalum	AV-TAP106K025HSB
	Connectors	
P1	10-pin dual row header	PN-051-010-153
J1	10-pin dual row socket	PN-050-010-455
	Diodes	
D1-11	Green LED	QT-MV54124A
D12	Yellow LED	QT-MV53124A
D13-15	Orange LED	HP-HLMP-T400
D16-20	Red LED	QT-MV57124A
D21-31	Green LED	QT-MV54124A
D32	Yellow LED	QT-MV53124A
D33-35	Orange LED	HP-HLMP-T400
D36-40	Red LED	QT-MV57124A
	Integrated Circuits	
IC1	64 LED driver	MM-MAX7219CWG
	Resistors	
R1	10K	
	Switches	
SW1	Slide SPDT	CK-TS01-C-K-E
1 pc.	Circuit card	LG-273A Bright-VU Display
<u>5-5 Power Supply</u>		
	Capacitors	
C1	6800uf/35V electrolytic	IL-688LBA035M2CD
C2	.1uf/50V ceramic	CE-UK50-104
C3,4	100uf/25V electrolytic	NI-UFS1E101MPJ
	Rectifiers	
RT1	6A pc mount / 240V	GI-GBPC-602
	Fuses	
F1	½ amp slow blow 20mm	LF-218.500
	Integrated Circuits	
IC1	Charge pump	LT-LT1054CN
1 pc.	8-pin dip socket	EM-100-083-10-1003
	Connectors	
P1	3-pin large header - locking	PN-MLSS156-3A
J1	3-pin large socket	PN-CE156F20-3A
J2	Power entry module/fuse holder	SR-6200.4115
	Switches	
SW1	Slide DPDT	CK-L202-121MS02QE
	Transformers	
T1	10V 2.4A International	SI-IF-24-16
1 pc.	Circuit card	LG-253A Super-VU Supply
1 pc.	Power cord (North America)	BE-17251

SYMBOL	DESCRIPTION	LOGITEK PART NUMBER
5-6 ADC Input Card		
Capacitors		
C1-4	75pf/1000V ceramic	CE-DD-750
C5,6	4.7uf/25V tantalum	AV-TAP475K025CCS
C7,8	2200pf/50V ceramic SMD	NC-NMC1206NPO222K50TR
C9-12	1uf/35V tantalum	AV-TAP105K035HSB
C13,14	4.7uf/25V tantalum	AV-TAP475K025CCS
C15	.1 uf/50V ceramic SMD	NC-NMC1206Z5U104M50T
C16,17	470pf/100V ceramic SMD	AV-12061A471JATMA
C18	.1 uf/50V ceramic SMD	NC-NMC1206Z5U104M50T
C19	.01uf/	AV-12065E103MATMA
C20,21	1uf/35V tantalum	AV-TAP105K035HSB
C22	.01uf/	AV-12065E103MATMA
C23	1 uf/50V ceramic SMD	NC-NMC1206Z5U104M50T
C24,25	470pf/100V ceramic SMD	AV-12061A471JATMA
C26	1 uf/50V Z5U SMD(1206)	NC-NMC1206Z5U104M50T
Diodes		
D1,2	5.4V zener	GI-1N4734A
Integrated Circuits		
IC1,2	Quiet op amp	SG-NE5532N
IC2,3	Balanced line receiver	AD-SSM2143P
IC5	-5VDC regulator/100 mA	MO-MC79L05ACP
IC6	+5VDC regulator/100 mA	MO-MC78L05ACP
IC7	ADC 16-bit stereo	AD-AD1877JR
4 pcs.	8-pin dip socket	EM-100-083-10-1003
Connectors		
J1,2	Phone jack switch PC	SW-RN-114BCP
J3	10-pin dual row socket	PN-050-010-455
Ferrites		
FR1-3	Ferrite bead	MU-BLM32A07PB
Resistors		
R1,2	21k, .1%	DL-RNC55H2102BS
R3-7	4220, 1%	
R8,9	50K multiturn trimpot	MP-CT9X503
R10,11	21K, .1%	DL-RNC55H2102BS
R12	4220, 1%	
R13-14	300	
1 pc.	ADC Input circuit card	LG-264A

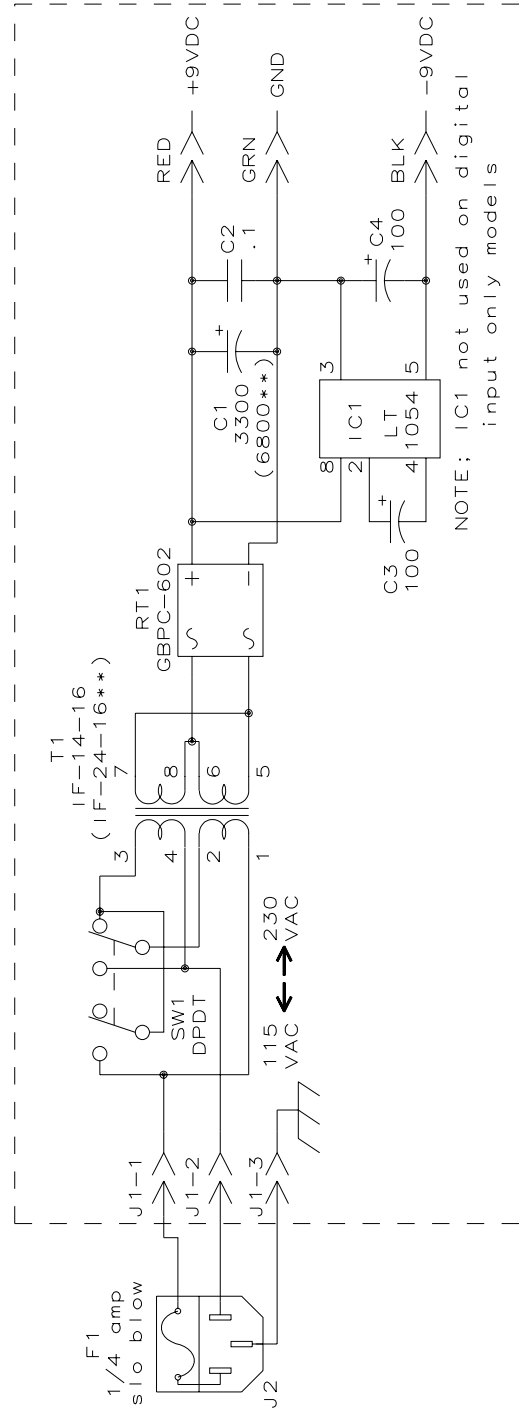
SECTION 6 — MANUFACTURERS LIST

CODE	MANUFACTURER	LOCATION
AD	Analog Devices Inc.	Norwood, MA
AV	AVX/Stantel Corp.	Myrtle Beach, SC
BE	Belden	Richmond, IN
CA	Catalyst Semiconductor	Santa Clara, CA
CE	Centralab Electronics Div.	Milwaukee, WI
CK	C&K Components	Newton, MA
CS	Crystal Semiconductor	Austin, TX
CT	CTS	Elkhart, IN
DL	Dale	Tempe, AZ
EM	Ecam Technology	Scottsdale, AZ
GI	General Instruments/Quality Technologies	Sunnyvale, CA
HP	Hewlett Packard Opto-electronics Div.	Santa Clara, CA
IL	Illinois Capacitor	Lincolnwood, IL
LF	Littlefuse	Des Plaines, IL
LG	Logitek (Circuit cards)	Houston, TX
LT	Linear Technologies	Milpitas, CA
MM	Maxim Integrated Products	Sunnyvale, CA
MO	Motorola Semiconductor Products	Phoenix, AZ
MP	Mepco/Electra Inc.	San Diego, CA
NC	NIC Components	Amityville, NY
NI	Nichicon Corporation	Schaumburg, IL
NT	Neutrik	Lakewood, NJ
PN	Panduit Corp.	Tinsley Park, IL
QT	Quality Technologies	Sunnyvale, CA
SI	Signal Transformers Co.	Inwood, NY
SR	Schurter Inc.	Petaluma, CA
SS	Schott Corp.	Minneapolis, MN

SECTION 7 — DIAGRAMS

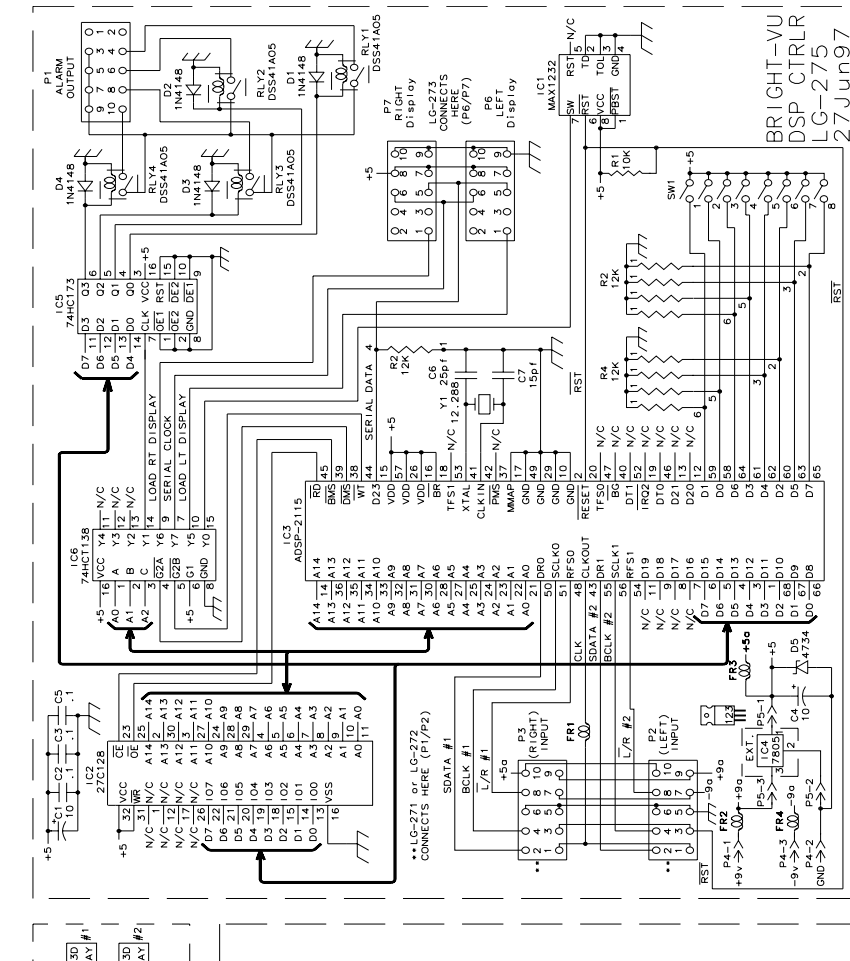
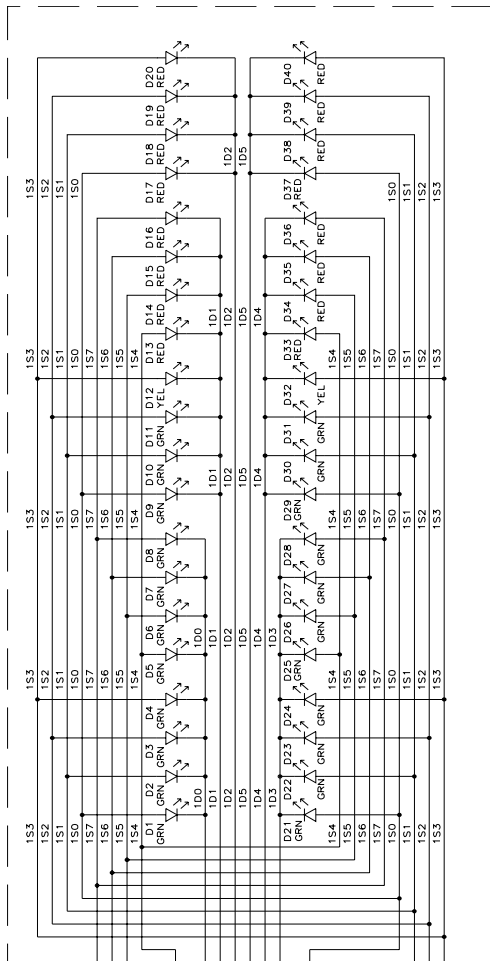
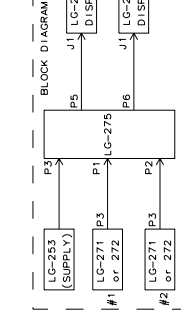
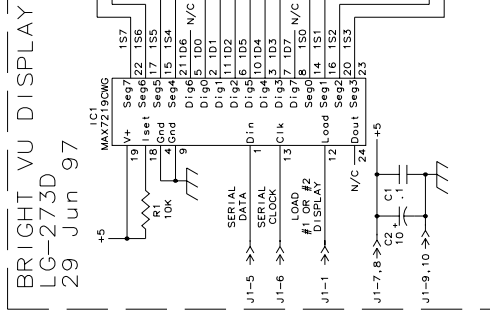
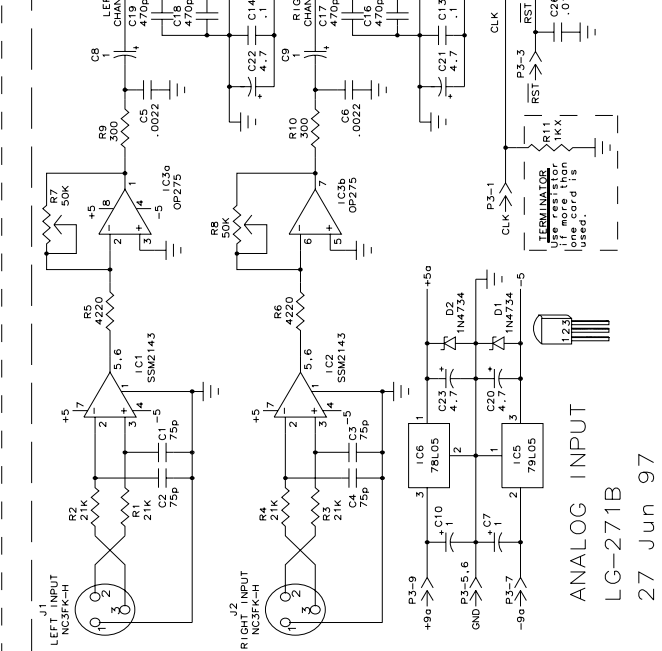
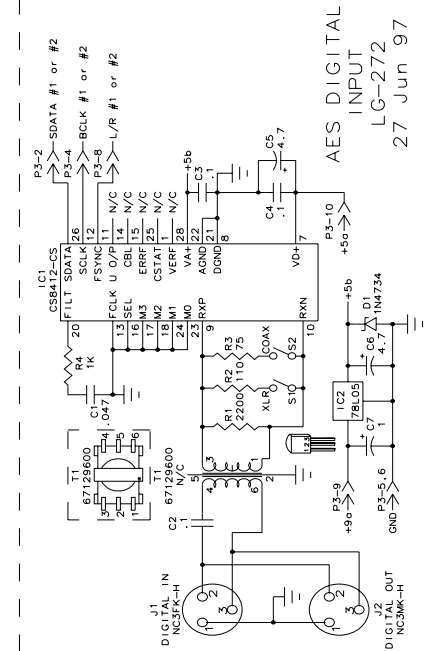
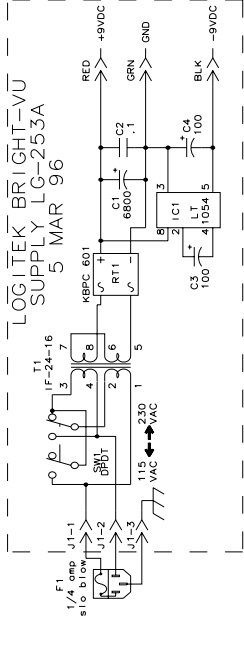


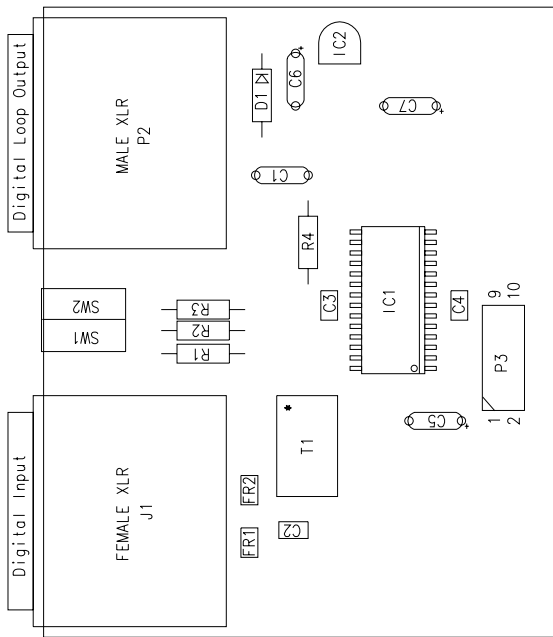
SVU, BVU, UVU SUPPLY LG-253
Component Diagram
31-Jan-94



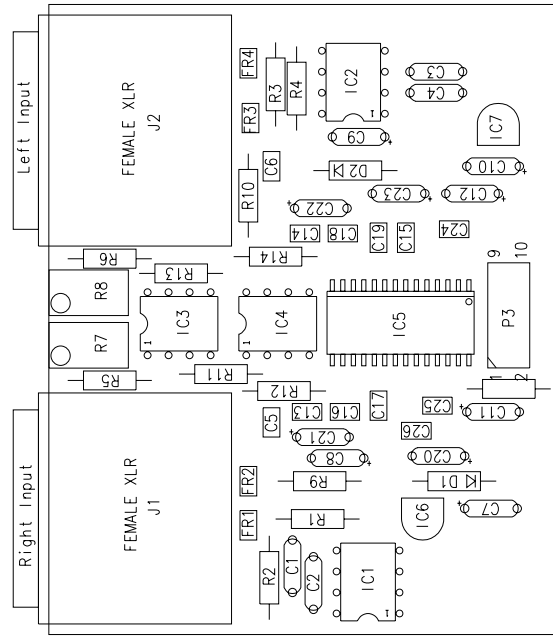
** These values are used on models
SIS2 and UV2 only

POWER SUPPLY
LG-253A

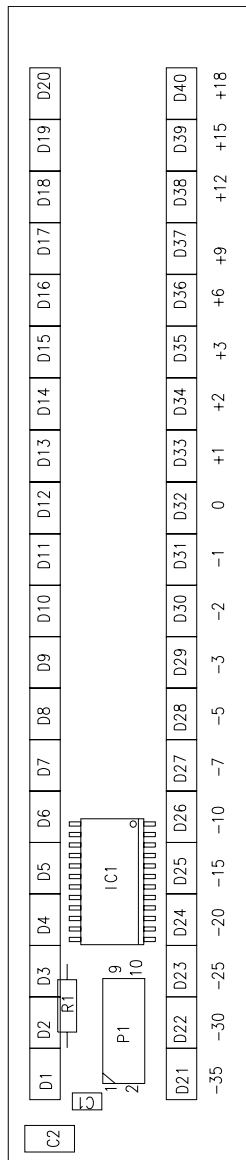




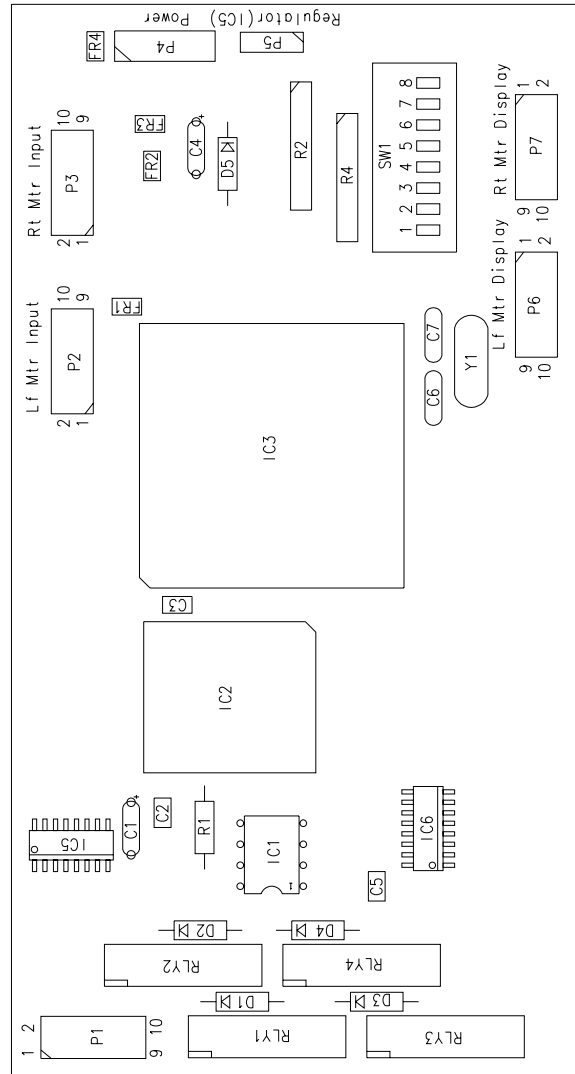
DIGITAL INPUT LG-272
Component Diagram
9-Dec-95



ANALOG INPUT LG-271
Component Diagram
9-Dec-95



BRIGHT-VU DISPLAY LG-273D
Component Diagram
20-Aug-96



BRIGHT-VU CTRL/ALARM LG-275
Component Diagram
9-Dec-96



TWO YEAR LIMITED WARRANTY

Logitek Electronic Systems, Inc. warrants its professional equipment (excluding Logitek Software, which is covered by a separate warranty) against defects in materials and workmanship for two years pursuant to the following terms and conditions. The warranty extends to the original purchaser only.

LOGITEK will repair or replace, at its option, at its factory without charge professional equipment if a defect in materials or workmanship develops during the first two years following purchase, when the equipment is returned to the factory or LOGITEK authorized service centers freight prepaid with a description of the nature of the failure. No reimbursements can be made for repair charges that are not factory authorized. After repair or replacement, LOGITEK will return the equipment to the purchaser freight prepaid.

In the event that any part of this professional equipment becomes defective during the first two years following purchase, and purchaser wishes to attempt repair, purchaser may obtain a replacement part by notifying LOGITEK of the part of the equipment which has failed. LOGITEK will thereafter ship a replacement part, freight prepaid. LOGITEK may require the purchaser to return the defective part to LOGITEK freight prepaid as a condition of such replacement, either before or after LOGITEK ships the replacement part. LOGITEK shall not be responsible for any other charges or liabilities associated with purchaser--made repairs.

No part or equipment shall be considered defective if it fails to operate due to exposure to extreme temperatures or excessive moisture in the atmosphere.

Light bulbs, batteries, potentiometers or other equipment not manufactured by Seller shall carry only the warranty, if any, of the original equipment manufacturer in effect at the time of shipment of this order; and Seller's obligation under this warranty shall be limited to such adjustment as Seller may obtain from the original manufacturer.

This limited warranty is void if equipment is modified or repaired without authorization; subjected to misuse, abuse, accident, water damage or other ne-

glect; or has had its serial number defaced or removed.

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