MEMO TO: All BAC Console Users

FROM: David W. Evans

Date: March 16, 1987

BROADCAST AUDIO CORPORATION
AUDIO DESIGN & MANUFACTURING

Responding to some of the most frequent inquiries we have received, the following data sheets are enclosed:

1. Solid State Relays, which can be driven directly from the +5v control logic to expand the relay capacity of BAC audio consoles. Order directly from Mouser Electronics, (817) 483-4422, in Texas, or (619) 449-2222, in California. The part number 519-RP120D03 and $13.22 price are from their 1987 catalog #553.

2. Henry Engineering Universal Turntable Controller, with a schematic showing our recommended modification to operate Techniques or Russco direct drive turntables from a maintained FORM C relay contact as provided by BAC consoles. The charging circuit makes it possible to use the turntable on/off switch independantly of the console control. The UTC is available from Broadcast Audio or Henry Engineering (818) 355-3656, both in California.

3. Multi-mixer Momentary Pulse Relay Driver. This schematic shows an ac coupled "OR" circuit which requires only one relay to reset a timer when any of several mixers are turned on.

4. Information on how to convert the Line Input of SERIES II consoles from 600 ohms to 10,000 ohms input impedance.

5. A schematic for a method of turning a mixer off on the trailing edge of an EOM or Tertiary tone from a cartridge machine. This allows the tone to signal the beginning of the next audio segment and permits audio overlap.

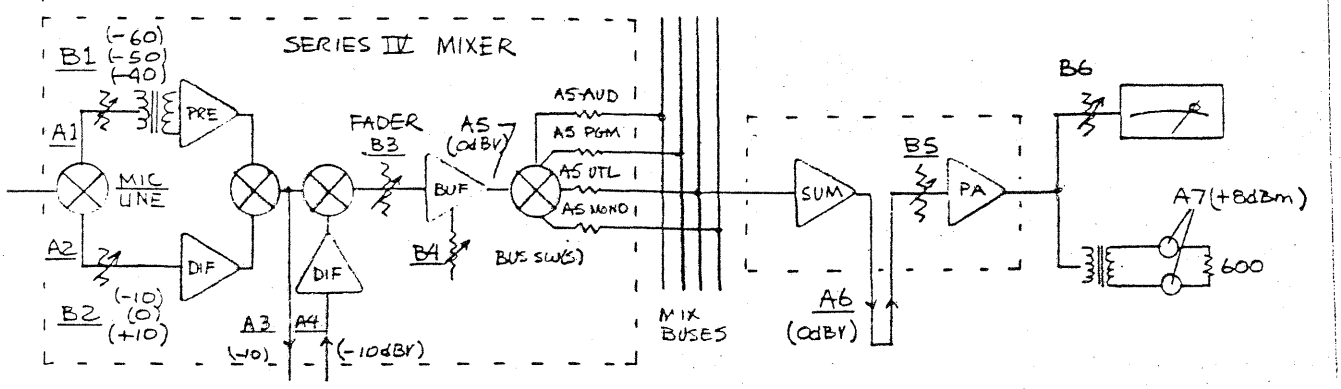
6. Audio Level Setup instructions for SERIES II and IV consoles. (System 20 Level Setup instructions will be sent only to users of System 20.

Additionally, we have several new products available, including a 6-mixer modular rack mount console; a digital timer with 15 independant reset inputs; and equalized headphone panel (retrofittable); a control room monitor module, with level controls, which mounts in place of the trim strip at the right edge of the console; and a new mixer module with a "send" feature. The "send" mixer takes 2 mono outputs from the mixer and sends them independantly to the utility left and right outputs, for reverb of other special effects. These will all be shown at NAB '87 and RADIO '87.

I hope the enclosed information is useful to you!

520
352.00

SYSTEM 20 MODULAR AUDIO CONSOLE SETUP AUDIO SIGNAL LEVELS



TEST PARAMETERS:

1. Use the above block diagram to locate the various AUDIO LEVEL TEST POINTS.

2. All audio voltage measurements are to be made with a high performance, high impedance voltmeter with a dB voltage scale.

3. Audio signal source generator should be a high quality, low distortion, sine wave signal with a frequency of 1000 Hz.

4. Harmonic and intermodulation distortion measurements should be under 0.05% while performing the following tests.

TEST CONDITIONS:

A1 - Microphone input test signal INPUT LEVEL; -55dBV ±0.5dB as measured at the input of the mixer.

A2 - Line level input test signal INPUT LEVEL; 0dBV ±0.5dB as measured at the input of the mixer.

B1 - The MIC/LINE switch set in the MIC setting (up position).

B2 - The Gain Trim -10/0/+10 dBm switch set at 0 (mid position).

A3 - INSERT (Patch) output (Send) level should be 0 dBV.

A4 - INSERT (Patch) input (Return) level to be 0 dBV.

B3 - FADER should be positioned to approximately "60" on the module face reference scale

NOTE: EQ equipped modules should have all EQ switches in the OUT (bypass) position. MODE equipped modules should be set in the STEREO mode, with the PAN control mechanically centered.

B4 - Gain adjust B4 L&R should be preset to their mid rotation position.

A5 - A5*AUD, A5*PGM, and A5*UTL, should have a signal voltage level of approximately 0dBV. Move FADER B3 for the closest compromise of 0dBV between A5 L&R signal levels. Then adjust controls B4 L&R for exactly a 0dBV signal voltage level at A5 L&R. (NOTE: It is almost impossible to measure a signal on the mixing bus, because of the extremely low input impedance of the summing amplifier on the Line Amplifiers.) There is no MONO mixing bus on the SYSTEM 20.

A6 - Voltage level should also be 0dBV at this time.

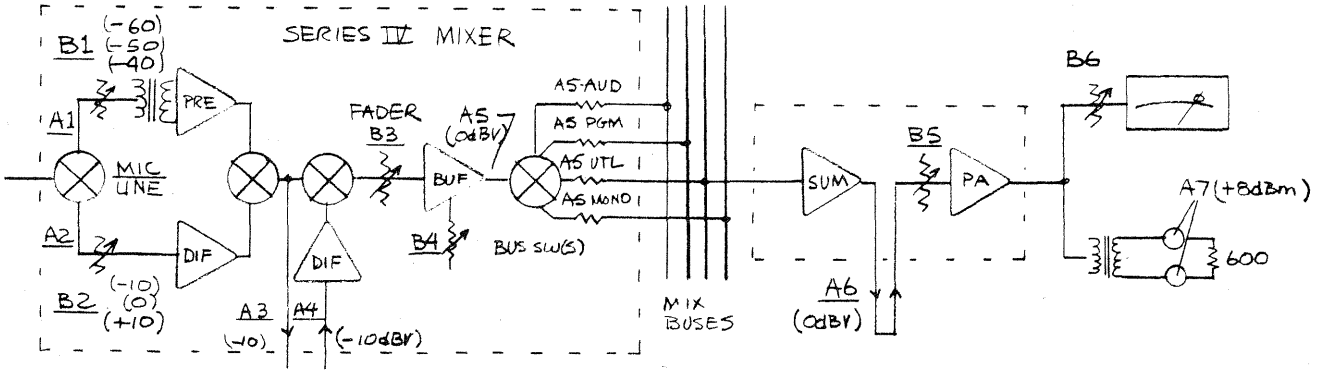
B5 - Level control on all Line Amplifier Cards should be adjusted to obtain an A7 output signal across the Console OUTPUT Terminals of +8dBm level (600 Ohms terminated). This process to be done for all program outputs (600 Ohms terminated). (NOTE: Serial #1-530 used linear trim pots and the normal setting is about 12 o'clock. Later consoles use log taper trim pots and the normal setting is about 3 o'clock). In Cue and Headphone amplifiers, the settings are higher than Line.

B6 - VU calibrate controls on meter motherboard should now be adjusted so that all VU Meters read 0 VU. (NOTE: It is not necessary to terminate each A7 output to adjust the VU Meter calibration).

Power Supplies: Set 12v supply to 12.5v, as measured at power supply barrier strip. Set 18v supplies to ±0.1v. ± 18V = SYSTEM 20 CONSOLES !

Peak Flashers: Ajust output level to +13dBm @ 1kHz; turn LED calibrate pot on meter motherboard until LED lights. (NOTE: This is the factory setting - individual station preference may vary).

SERIES II/ IV MODULAR AUDIO CONSOLE SETUP AUDIO SIGNAL LEVELS



TEST PARAMETERS:

1. Use the above block diagram to locate the various AUDIO LEVEL TEST POINTS.

2. All audio voltage measurements are to be made with a high performance, high impedance voltmeter with a dB voltage scale.

3. Audio signal source generator should be a high quality, low distortion, sine wave signal with a frequency of 1000 Hz.

4. Harmonic and intermodulation distortion measurements should be under 0.05% while performing the following tests.

TEST CONDITIONS:

A1 - Microphone input test signal INPUT LEVEL; -50dBV ±0.1dB as measured at the input of the mixer.

A2 - Line level input test signal INPUT LEVEL; 0dBV ±0.1dB as measured at the input of the mixer.

B1 - The MIC/LINE switch set in the MIC setting (up position).

B2 - The Gain Trim -10/0/+10 dBm switch set at 0 (mid position).

A3 - INSERT (Patch) output (Send) level should be -10dBV. (IV ONLY)

A4 - INSERT (Patch) input (Return) level to be -10dBV. (IV ONLY)

B3 - FADER should be positioned to approximately "50" on the module face reference scale

B4 - Gain adjust B4 L&R should be preset to their mid rotation position.

A5 - A5*AUD, A5*PGM, A5*UTL, A5*MONO should have a signal voltage level approximately 0dBV. Move FADER B3 for the closest compromise of 0dBV between A5 L&R signal levels. Then adjust controls B4 L&R for exactly a 0dBV signal voltage level at A5 L&R. (NOTE: It is almost impossible to measure a signal on the mixing bus, because of the extremely low input impedance of the summing amplifier on the Line Amplifiers.)

A6 - Voltage level should also be 0dBV at this time.

B5 - Level control on all Line Amplifier Cards should be adjusted to obtain an A7 output signal across the Console OUTPUT Terminals of +8dBm level (600 Ohms terminated). This process to be done for all program outputs (600 Ohms terminated). (NOTE: Serial #1-530 used linear trim pots and the normal setting is about 12 o'clock. Later consoles use log taper trim pots and the normal setting is about 3 o'clock). In Cue and Headphone amplifiers, the settings are higher than Line.

B6 - VU calibrate controls on meter motherboard should now be adjusted so that all VU Meters read 0 VU. (NOTE: It is not necessary to terminate each A7 output to adjust the VU Meter calibration).

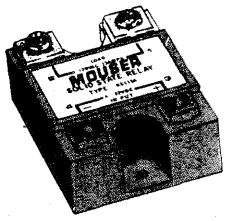
Power Supplies: Set 12v supply to 12.5v, as measured at power supply barrier strip. Set 28v supply to 30v ±0.1v. (NOTE: Supply is designed to produce 30v). 30V = SERIES II/IV CONSOLES ONLY!

Peak Flashers: Ajust output level to +13dBm @ 1kHz; turn LED calibrate pot on meter motherboard until LED lights. (NOTE: This is the factory setting - individual station preference may vary).

Solid State Relays

MOUSER® SOLID STATE RELAYS

THESE SOLID STATE RELAYS ARE OPTICALLY COUPLED BETWEEN CONTROL AND LOAD CIRCUITS WHICH PROVIDES A MINIMUM OF 2500 VRMS INPUT/OUTPUT ISOLATION. SYNCHRONOUS ZERO VOLTAGE TURN-ON AND ZERO CURRENT TURN-OFF MINIMIZE SWITCHING TRANSIENTS AND EMI. IMPROVED CIRCUIT DESIGN AND BUILT IN SNUBBER PROTECTION GUARANTEE HIGH IMMUNITY FROM FALSE TRIGGERING AND RELIABLE SWITCHING OF LOW POWER FACTOR LOADS. CONSTANT CURRENT INPUT CIRCUITRY REDUCES EXCESSIVE POWER DISSIPATION AT HIGHER INPUT VOLTAGE LEVELS.

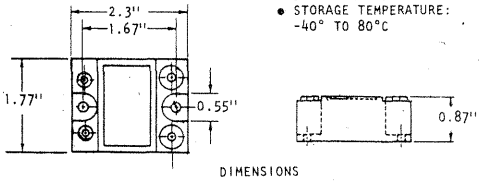


FEATURES

- HIGH SURGE CURRENT HANDLING CAPABILITY
- LONG LIFE, HIGH RELIABILITY
- ELECTRICALLY ISOLATED MOUNTING PLATE
- NO CONTACT BOUNCE-NO TRANSIENT REFLECTIONS BACK INTO CONTROL CIRCUITRY-ELIMINATES CONTACT NOISE.

SPECIFICATIONS

- CONTROL VOLTS: 4 TO 32 VDC
- DIELECTRIC STRENGTH:2.5 KV (MIN)
- REVERSE VOLTAGE PROTECTION: 32 VDC (MIN)
- STORAGE TEMPERATURE: -40° TO 80°C

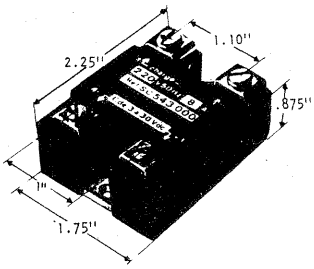


DIMENSIONS

STOCK NO.	OPERATING VOLTAGE	CURRENT RATING	SURGE CURRENT	PRICE EACH 1	5	10	25
ME431-2100	12-140	10A	100A	18.99	17.99	17.39	CALL FOR QUOTE

MOUSER® SOLID STATE RELAYS

THESE SOLID STATE RELAYS FEATURE SOLID, RUGGED CONSTRUCTION COMPLETELY EPOXY MOLDED. INPUT/OUTPUT ISOLATION IS BY PHOTO COUPLER. THIS UNIT HAS SCREW TERMINALS RATED @ 40 AMP/380 VOLTS. THE ADVANTAGES OF SOLID STATE SWITCHING ARE: MINIMAL RADIATED INTERFERENCE AND CONDUCTIVE INTERFACE, AND INCREASED LIFE OF TUNGSTEN LOADS DUE TO MINIMIZED DI/DT.

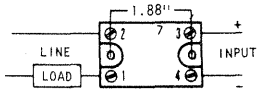


FEATURES

- LOAD VOLTAGE: 220VAC
- CONTROL VOLTAGE: 3-30DC
- PICK UP VOLTAGE: 3
- RELEASE VOLTAGE:1
- INPUT CURRENT: 5mA

CROSS REFERENCES
OPTO POWER SERIES MODEL 1200's
DOUGLAS RANDALL SERIES K
GORDOS GA SERIES
ALLIED SERIES E-6
GUARDIAN GSR SERIES
RANCO RP SERIES

- **UL LISTED (FILE #E69913)**
- **EPOXY MOLDED**



STOCK NO.	LOAD CURRENT	PRICE EACH 1	5	10	25
ME433-SC543000	8A	17.99	16.99	16.59	CALL
ME433-SC545000	15A	19.49	18.69	17.99	FOR
ME433-SC547000	25A	19.99	18.99	18.49	QUOTE
ME433-SC549000	40A	27.79	25.25	23.99	

RANCO ELECTRONICS DIVISION HYBRID SOLID STATE RELAYS

FEATURES

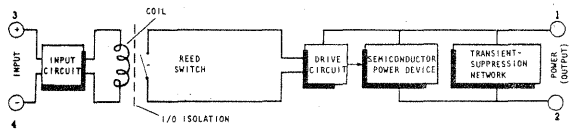
- DESIGNED TO MEET DEMANDING VDE STANDARDS
- PROVIDES FASTER SWITCHING RESPONSE
- HIGH SURGE CURRENT BOUNCE AND TRANSIENT REFLECTIONS BACK INTO CONTROL CIRCUITRY TO ASSURE QUICK OPERATION
- REQUIRES MINIMUM ACTUATION POWER WIDE CHOICE OF VOLTAGE RATINGS

SPECIFICATIONS

- NOMINAL COIL VOLTAGE: 12VDC
- DIELECTRIC STRENGTH: 3.75kV
- RELEASE STORAGE: 1VDC
- STORAGE TEMP: -40°C to +100°C

- **UL RECOGNIZED (FILE #E52946)**
- **CSA CERTIFIED (FILE #LR23344)**
- **NOMINAL COIL VOLTAGE: 12VDC**

INTERNAL FUNCTIONAL BLOCK DIAGRAM



TERMINALS ARE 1/4" QUICK-CONNECT, REQUIRING NO SOLDERING.

STOCK NO.	AC VOLTS	CURRENT RATING	SURGE CURRENT	PRICE EACH 1	10	50	100
519-RE120D15	120	15A	150A	11.20	10.47	9.99	CALL
519-RE120D30	120	30A	250A	12.20	11.47	10.99	FOR
519-RE240D15	240	15A	150A	11.53	10.78	10.28	QUOTE
519-RE240D30	240	30	250A	12.68	11.92	11.42	

RANCO ELECTRONICS DIVISION SOLID STATE RELAYS

OPTICALLY ISOLATED ZERO CROSSOVER

FEATURES

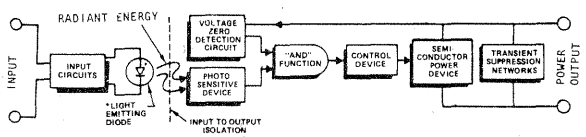
- EXCLUSIVE-INDUSTRY'S ONLY SHIELDED OPTO-ISOLATOR INCREASES THE WITHSTAND LEVEL OF COMMON MODE VOLTAGE
- EXCLUSIVE-INDUSTRY'S ONLY TWO-STAGE TRIMMING OF INPUT VOLTAGE AND SCR SENSITIVITY FOR IMPROVED PERFORMANCE
- INDUSTRY'S LOWEST ZERO SYNCHRONOUS TURN-ON MINIMIZES RFI AND SURGE CURRENTS
- INDUSTRY'S LARGEST HEAT SINK OFFERS BETTER RELIABILITY DUE TO SUPERIOR HEAT DISSIPATION.
- HAS ANTI-ROTATION CLIPS FOR ELECTRICAL HOOK-UP

SPECIFICATIONS

- CONTROL VOLTS: 3 TO 32VDC
- DIELECTRIC STRENGTH: 4kV (MIN)
- RELEASE VOLTAGE: 1VDC
- STORAGE TEMP: -40°C TO +100°C

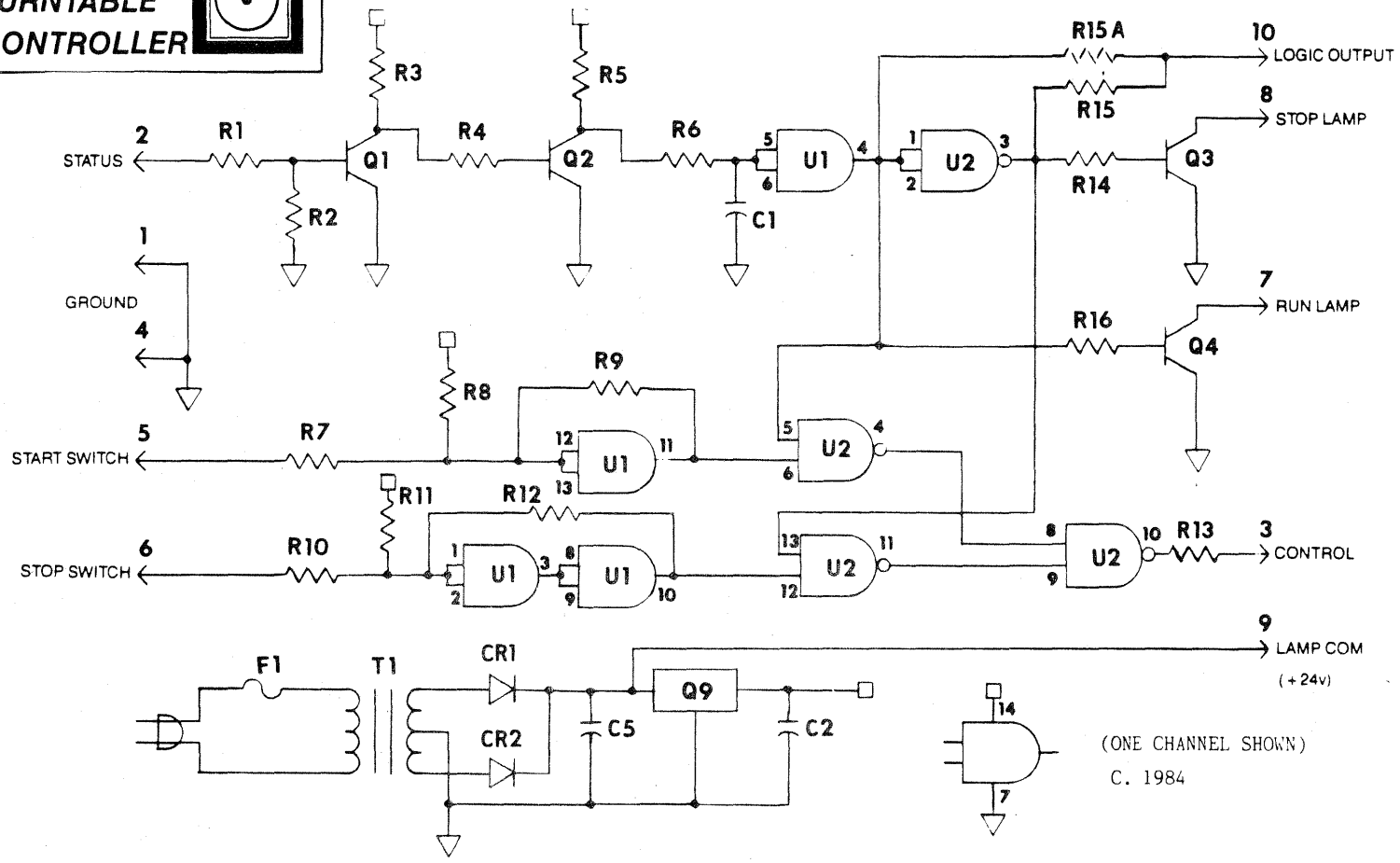
- **UL RECOGNIZED**
- **CONTROL VOLTAGE : 3 TO 32VDC**

INTERNAL FUNCTIONAL BLOCK DIAGRAM



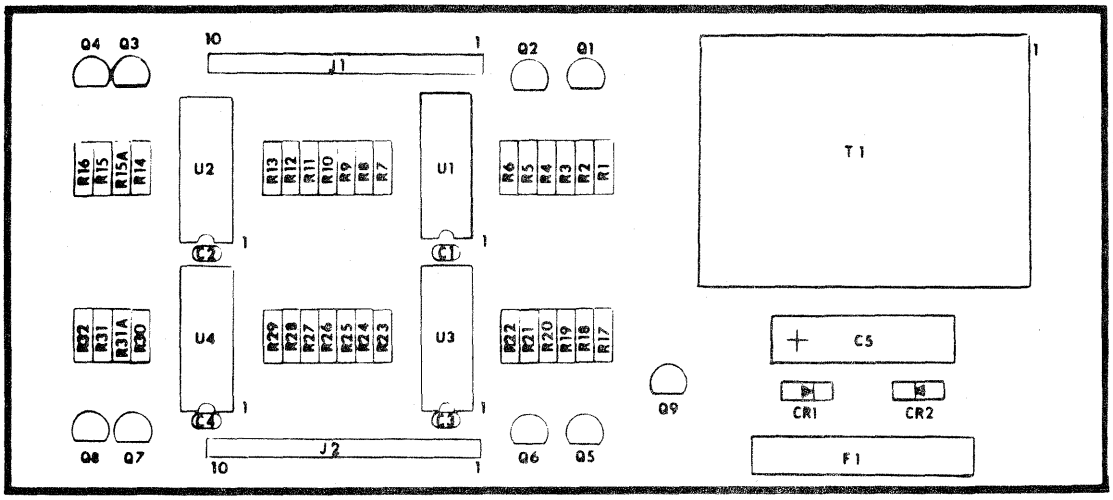
STOCK NO.	OPERATING VOLTAGE	CURRENT RATING	SURGE CURRENT	PRICE EACH 1	10	50	100
519-RP120D03	24-140	3A	25A	13.22	12.14	11.22	CALL
519-RP120D05	24-140	5A	55A	15.52	14.28	12.90	FOR
519-RP120D10	24-140	10A	110A	19.08	17.47	15.78	QUOTE
519-RP120D25	24-140	25A	250A	19.91	18.24	16.46	
519-RP240D03	40-280	3A	25A	14.52	13.60	12.08	
519-RP240D05	40-280	5A	55A	15.80	14.52	13.14	
519-RP240D10	40-280	10A	110A	19.32	17.71	16.44	
519-RP240D25	40-280	25A	250A	20.15	18.79	16.89	

UNIVERSAL TURNTABLE CONTROLLER



(ONE CHANNEL SHOWN)

C. 1984



R1,2,17,18 = 100K
R7,10,13,15,23,26,29,31 =100 OHM
R9,12,25,28 = OMITTED
All other R = 10 K
C1,2,3,4 =.1uf/50
C5 =100uf/35
CR1,2 = 1N4004
Q1-Q8 = 2N4401
Q9 = LM34012
U1,U3 = CD4071
U2,U4 = CD4001
FUSE: 1/8 amp

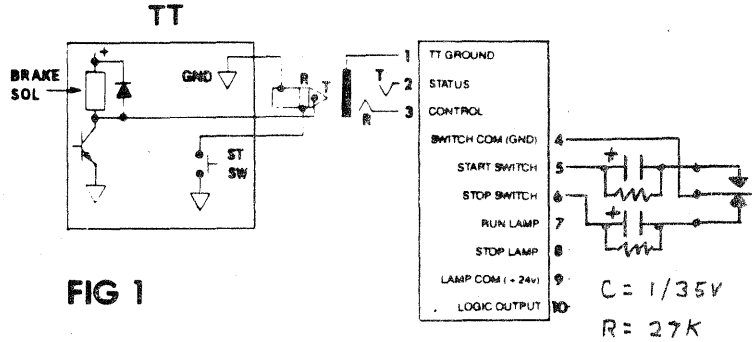


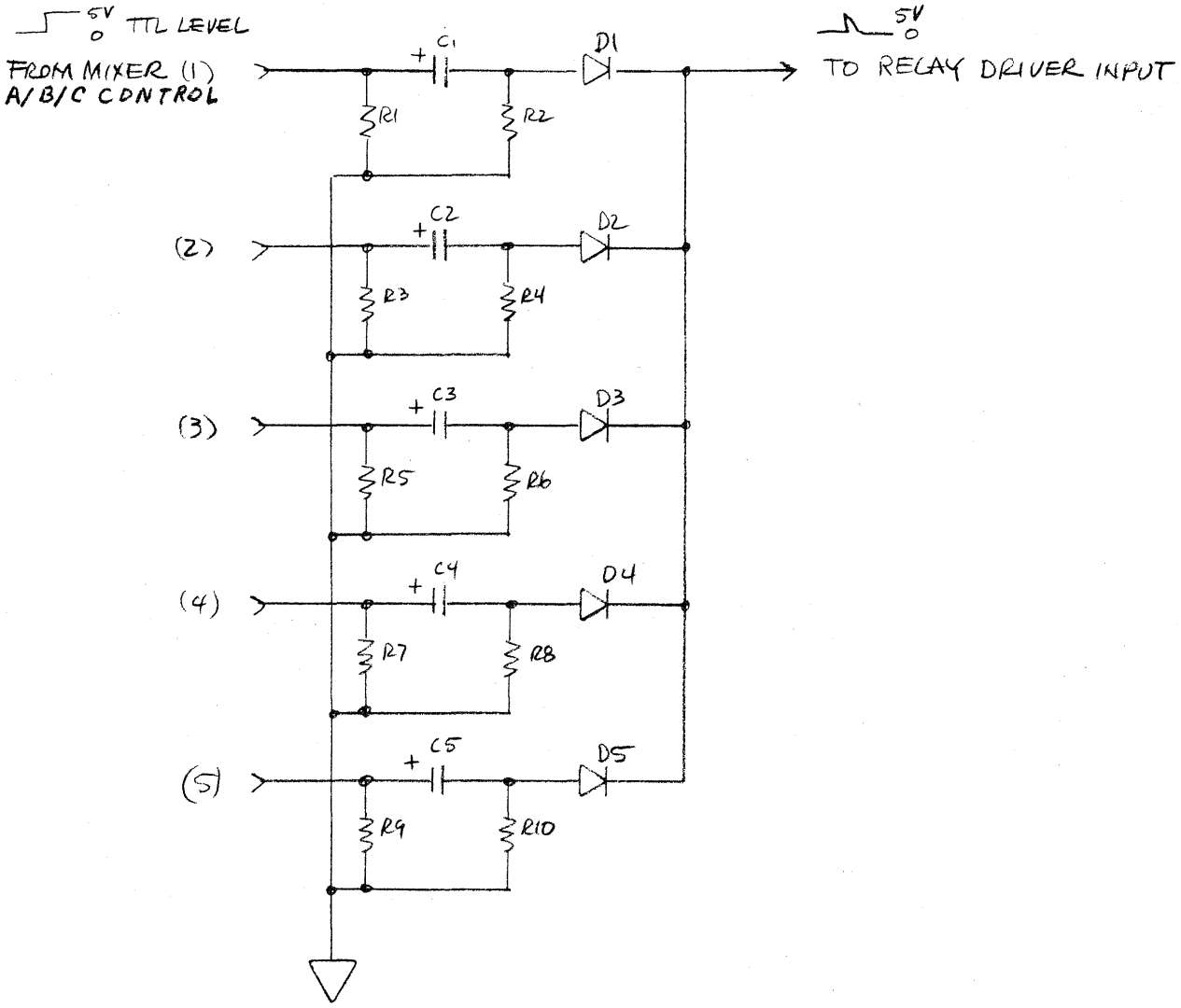
FIG 1

C = 1/35V
R = 27K

Maintained contact relay from BAC console

BROADCAST AUDIO CORPORATION
AUDIO DESIGN & MANUFACTURING

MULTI-MIXER ON/START MOMENTARY PULSE RELAY DRIVER



C1,2,3,4,5 - - - - - - - 1mF 10VDC OR 10mF 10VDC
D1,2,3,4,5 - - - - - - IN914B OR IN4148
R1,2,3,4,5,6,7,8,9,10 - 10K 5% 1/4 W

RMAJESMC 3/11/84

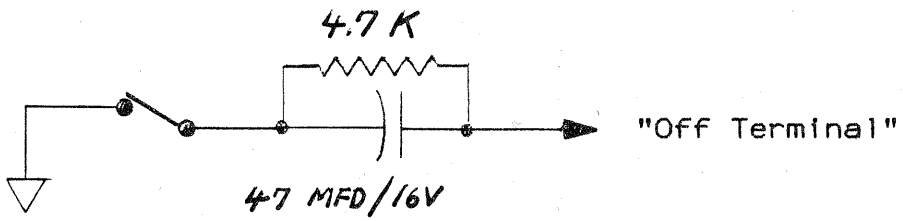
11306 Sunco Drive • Rancho Cordova, CA 95670 • (916) 635-1048

SERIES II LINE LEVEL INPUT PAD MODIFICATION FOR 10,000 OHM INPUT IMPEDANCE

To convert the existing 600 Ohm impedance, line level mixer input to 10,000 Ohm input impedance, the input PAD(s) must be modified as follows:

1. Remove R1, R2, R3, and R4 (309 Ohm) resistors.
2. Replace R1, R2, R3, and R4 with 4.99K Ohm 1% Metal Film resistors.
3. Remove R5 and R6 (1 Ohm) resistors.
4. Replace R5 and R6 with 18.2 Ohm 1% Metal Film resistors.

CIRCUIT TO TURN CONSOLE OFF ON <u>TRAILING</u> EDGE OF EOM CONTACT



N. C. Contact From Cartridge Player

This enables the EOM to cue start of next audio and allows audio overlap.

142 SIERRA ST., EL SEGUNDO, CALIFORNIA 90245 (213) 322-2136

Operation and Maintenance Manual

ES 570
WITH OPTION "V"

Operating Instructions

The ES-570 is a four digit, Sixty or One Hundred minute Timer, selectable on the rear connector.

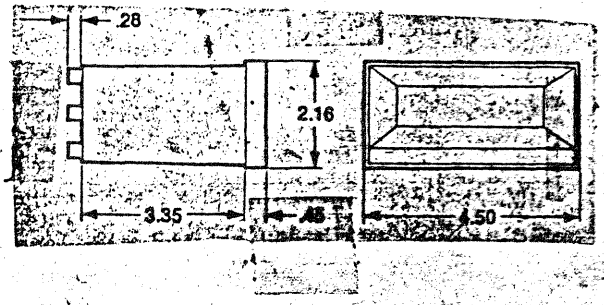
Each unit has three controls (Start, Stop, and Reset) accessible on the rear mounted connector. In addition to the controls, the rear mounted connector can optionally have BCD outputs. For the DC option, +5 volts DC must be supplied to this connector. The timer will run continuously unless stopped. If stopped it will hold the time displayed when it was stopped. Start control will initiate timing from the time on the display. The reset control returns the display to 00:00. The timer may be reset while it is stopped or while it is running. If it is reset while running it will reset to 00:00 and continue to run. All control inputs require a momentary closure to ground to operate. When power is first applied, the display may come on at a random time. It is recommended that after first application of power or after power loss the timer be reset to clear all counters and begin normal operation.

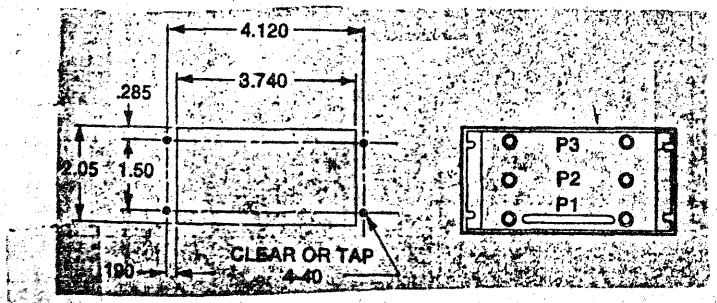
Specifications

Mechanical - Molded Plastic Case 2" High x 3.7" Wide x 4.1" Deep (excluding Bezel).

Electrical - Input voltage 117VAc 60 Hz; Power Requirement 4W Max. +5VDc optional.

Mounting Dimensions

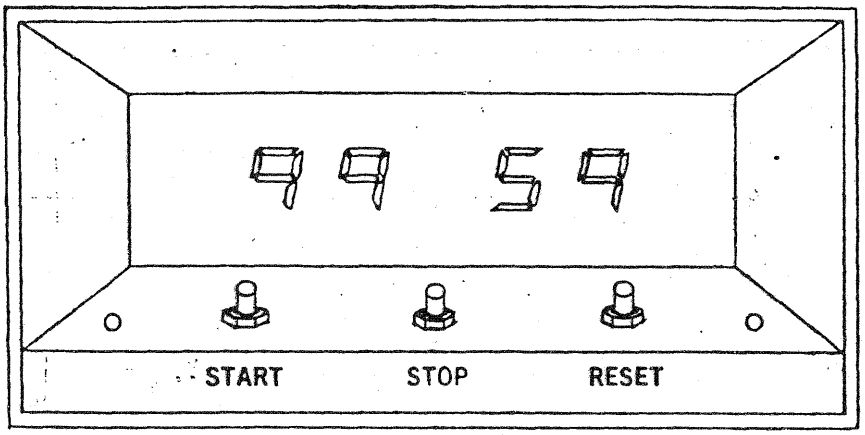




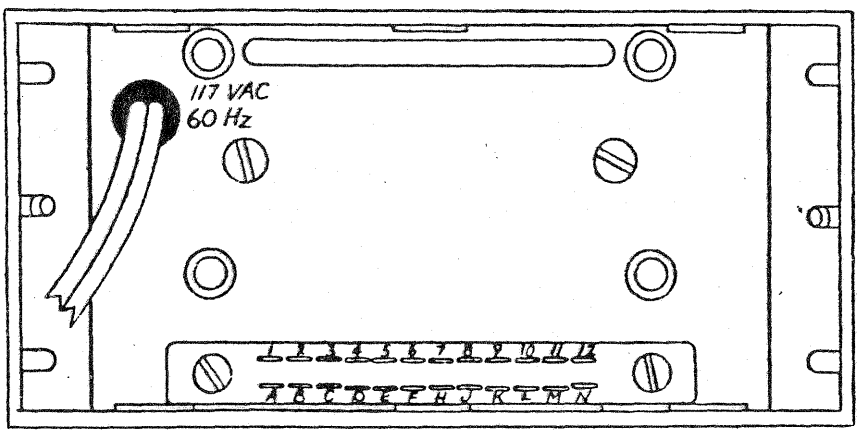
NOTE: Bezel is a snap on type for easy removal.

ES-570

FRONT VIEW



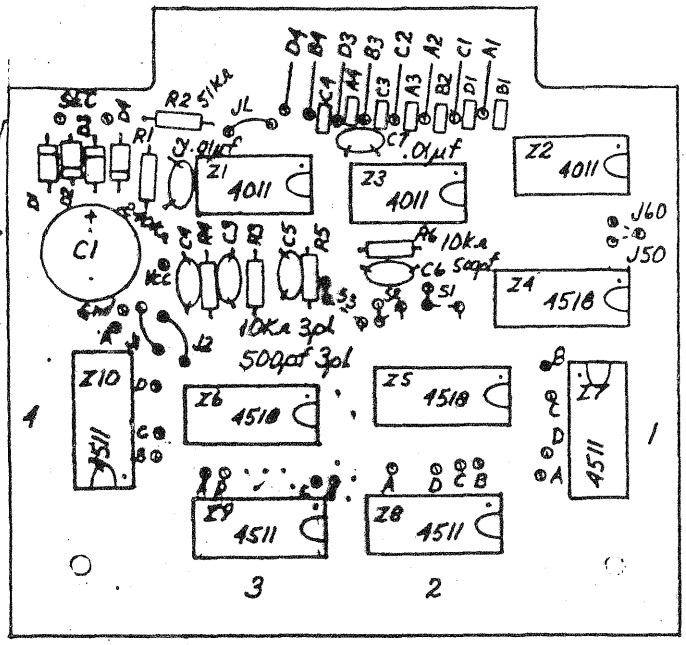
REAR VIEW



Pin	Function	Pin	Function
1	B1	A	A1
2	D1	B	C1
3	B2	C	A2
4	A3	D	C2
5	C3	E	B3
6	A4	F	D3
7	C4	H	B4
8	N/C	J	D4
9	Reset	K	Short for 60 Min.
10	Start	L	
11	Stop	M	N/C
12	Vcc (DC input only)	N	Ground

NOTE: All controls are activated by a momentary switch closure between the appropriate control input and ground.

ES-570



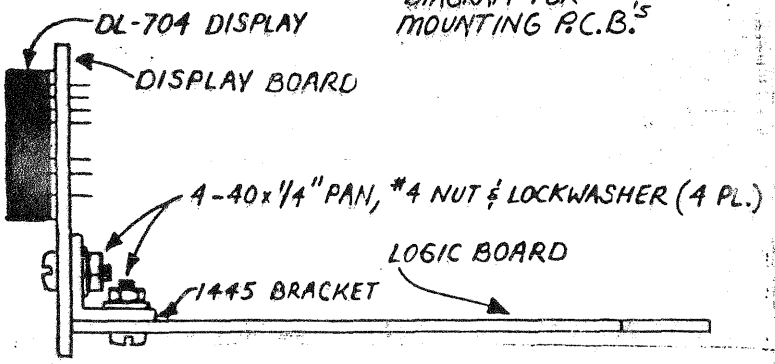
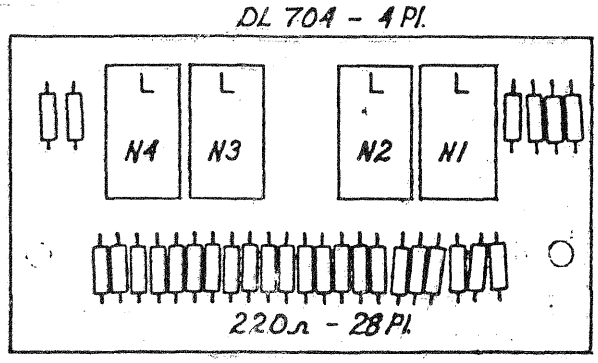


DIAGRAM FOR MOUNTING P.C.B.'s

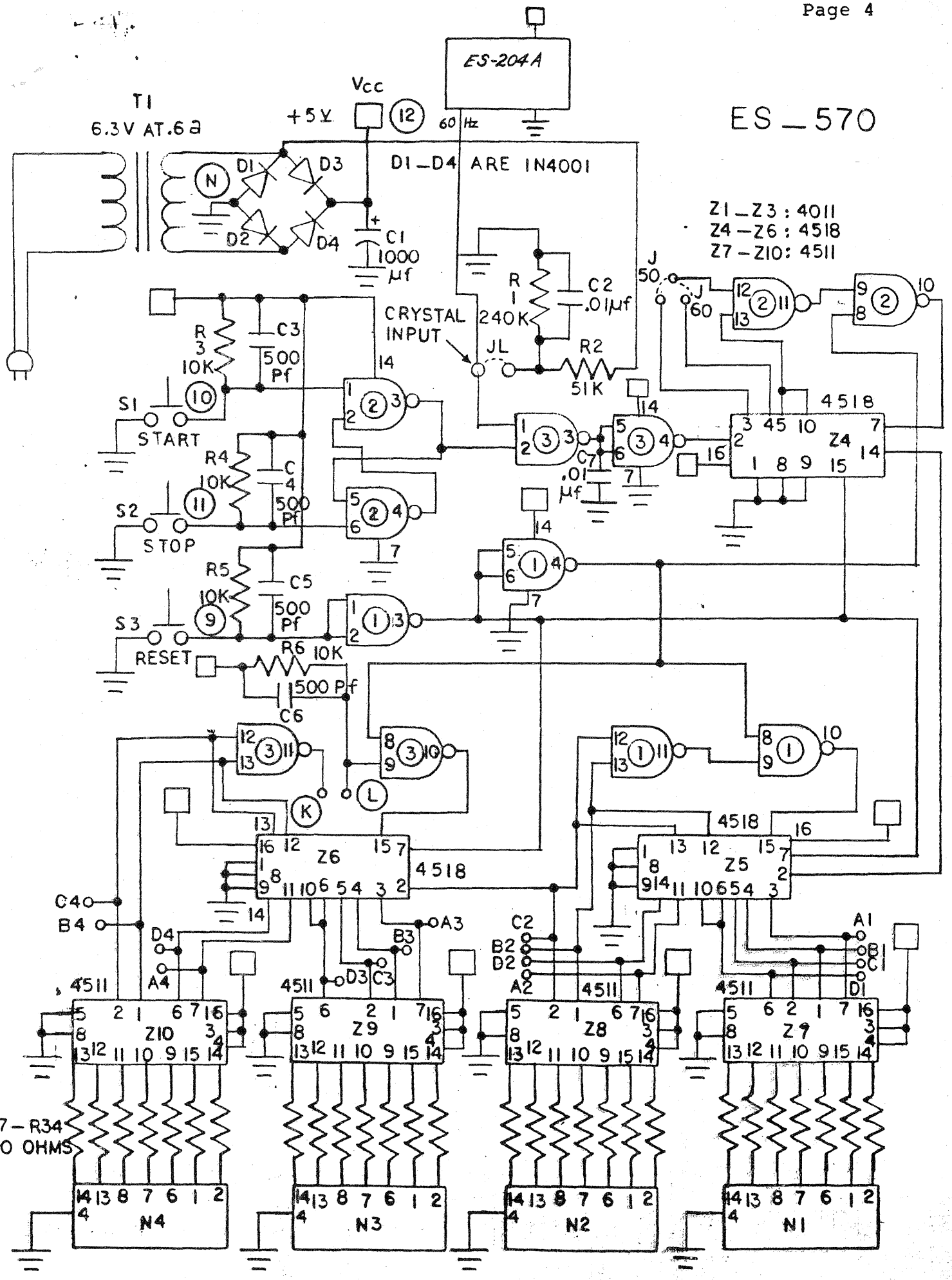


ES 570 Parts List

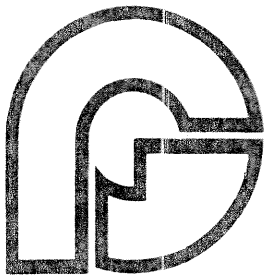
Qty	Designation	Description	P/N
3	Z1, Z2, Z3	IC	CD4011
3	Z4, Z5, Z6	IC	CD4518
4	Z7 - Z10	IC	CD4511
4	D1 - D4	Diodes	1N4001
1	R1	Resistor	240K 1/4W 10%
1	R2	Resistor	51K 1/4W 10%
4	R3 - R6	Resistor	10K 1/4W 10%
28	R7 - R34	Resistor	220 Ohm 1/4W 10%
1	C1	Capacitor	1000uf Min 10V Min.
2	C2 & C7	Capacitor	.01uf ±20% 25V Min.
4	C3 - C6	Capacitor	500pf 20% 25V Min.
4	N1 - N4	LED	NSN74R or Equiv.
1	T1	Transformer 6.3V @ 600MA	P-6465 or Equiv.
1		Connector	Cinch 50-24-A-30 or Equiv.
1		Molded Plastic Case & Bezel	
1		PCB	ES 570
1		Line Cord	2 Wire 6'
2		Wire Caps	71B
2		"L" Bracket	No. 1445

Optional Parts

3	S1, S2, S3	**Momentary Switches**
1	ES 202	**Crystal Oscillator Board**


ES-204A
Vcc
+5V
12
60 Hz
T1
6.3V AT.6a
N
D1
D2
D3
D4
D1–D4 ARE IN4001
C1
1000 µf
ES–570
Z1–Z3 : 4011
Z4–Z6 : 4518
Z7–Z10: 4511
R 1 240K
C2 .01µf
CRYSTAL INPUT
JL
R2 51K
J 50
J 60
R 3 10K
C3 500 Pf
S1 START
R4 10K
C 4 500 Pf
S2 STOP
R5 10K
C5 500 Pf
S3 RESET
R6 10K
C6 500 Pf
C7 .01 µf
4518
Z4
Z5
Z6
K
L
C4
B4
D4
A4
B3
A3
C2
B2
D2
A2
A1
B1
C1
D1
D3
C3
4511
Z10
Z9
Z8
Z7
R 7 – R34
220 OHMS
N4
N3
N2
N1
N1–N4 : NSN 74
INDICATES CONNECTOR PIN

Penny & Giles Conductive Plastics Limited
Newbridge Road Industrial Estate Pontllanfraith
Blackwood Gwent NP2 2YD South Wales United Kingdom
Telephone Blackwood (0495) 223771 Telex 49135
a member of the Penny & Giles group of companies



please reply to ...rnia 90401 **Telephone (213) 393-0014** ~~Telex:65-2357~~

PENNY & GILES
2716 Ocean Park Blvd. Suite 1005
Santa Monica, CA 90405 U.S.A.
(213) 393-0014

MAINTENANCE MANUAL

Conductive Plastic Studio Faders

Series - PGF 1100, 1500 and 1900

1. INTRODUCTION

1.1. This manual is intended to enable the user of PGF series faders to perform simple maintenance tasks such as cleaning and adjustment. Where possible test methods have been devised using only equipment normally available to any studio maintenance department.

The following tools and test equipment will be required to perform the various tasks.

1.2. Test Equipment

(a) Multimeter

(b) Signal Generator. Output 0 dbm.
Range 30 Hz to 20K Hz.
e.g. Levell type TG. 150M.

(c) A.C. Microvoltmeter Range 1.5 microvolts to 1.5 volts F.S.D. (scaled in dB).
Frequency response 10Hz to 25K Hz.
e.g. Levell Type TM3B

(d) Audio Amplifier and Loudspeaker

1.3. Small Tools

Screwdrivers

(a) Instrument Type 3 mm dia. blade.

(b) Posidriv Crosspoint Size No. 0. pt. (Stanley No. 5330)

(c) Posidriv Crosspoint Size No. 1. pt. (Stanley No. 5361)

Box Spanners

(d) 6 b.a.

(e) 8 b.a.

(f) M.2.

(g) M.3.

(h) Soldering iron

1.4. Materials

Instrument Oil D.T.D. 822 A
Dow Corning Silicone Fluid DC.510/50 cs.
Molybdenum Disulphide Loaded Grease

2. TEST PROCEDURES

2.1. Attenuation Law

(a) Connect a signal generator to the input terminals and a microvoltmeter (calibrated in decibels) to the output terminals. Set the output frequency to 1K Hz.

(b) With the slider at zero on the scale adjust the input level to give a meter reading of 0 dbm.

(c) Move the slider down the scale and note the meter reading when the slider is centered on each of the scale markings. Check that the readings obtained are within the range quoted in the catalogue.

(d) If the fader has more than one channel repeat the above procedure for each channel to check channel matching with respect to reference channel.

2.2. Noise Test

(a) Apply a 1K Hz signal at a level of 0 dbm to each channel input in turn with the fader output taken to a loudspeaker via a power amplifier.

(b) Move the slider along the scale while listening to the output from the loudspeaker. There should be no detectable "noise" over the 1K Hz tone.

2.3. Insertion Loss

(a) Connect a signal generator to the input terminals of the channel under test and a microvoltmeter to the output terminals.

(b) Adjust the input level until the meter reads 0 dbm with the slider at zero on the scale.

(c) Remove the meter input from the fader and measure the output level of the signal generator. The amount by which this exceeds 0 dbm is the insertion loss. Note: Do not disconnect the channel when testing the signal generator output level.

2.4 Switch Test

(a) With the slider at zero on the scale check that all switches are made in the normally closed position as shown in the circuit diagrams. This may be done by use of a resistance meter or by use of an indicator lamp. (Note that the current passed in testing must not exceed 50 mA or there is a danger that the gold plating on the switch contacts will be damaged. This will cause noise if the switches are used in low level circuits.)

(b) Move the slider to the infinity attenuation end of the scale and check that the "auxiliary" and "infinity" microswitches have changed over to make contact between the common and normally open contacts.

(c) Move the slider slowly towards zero and check that the "auxiliary" and "infinity" switches operate within 4mm (0.16") of the infinity position.

(d) Test the "overpress" switch, if fitted, by checking that the switch operates when the slider is moved beyond the infinity position against the action of the overpress spring. Check that there is at least 0.25mm (0.010") overtravel beyond the point at which the switch operates.

2.5. Leakage (Attenuation at infinity)

(a) Connect up fader to signal generator and meter as for the attenuation law test.

(b) Set the signal generator frequency to 15K Hz and adjust the level so that the meter reads 0 dbm with the fader slider at zero.

(c) Move the fader slider to the infinity position and note the meter reading of the leakage.
Note: It is essential that all leads are effectively screened when making leakage measurements. Also when input and output have a "common" point this must be at the fader connector to avoid incorrect values due to lead resistance.

3. CLEANING AND ADJUSTMENT

3.1. Cleaning

(a) Remove side cover. (Note that in the case of double module faders such as 1552 and 1524 the side cover is restrained by wiring to the second track moulding and cannot be completely detached.) The track and microswitches will now be accessible for cleaning.

(b) Rinse the fader under a tap with warm clean water. This will remove common contaminants such as coffee, coca-cola and alcoholic drinks. If necessary a soft brush may be used to remove heavy deposits. Take care to avoid damage to the wiper fingers.

(c) Dry the fader thoroughly by placing in a warm dry atmosphere or by use of a hot air blower or hair dryer.

(d) Apply a light smear of molydbenum disulphide loaded grease to the switch operating ramps on the switch operating bracket.

(e) Replace side cover.

(f) Check performance characteristics as per catalogue or users specification.

3.2. Switch Adjustment

(a) Remove side cover.

(b) Slacken the slotted head screw retaining the microswitch.

(c) Adjust the operating point as required by turning the microswitch on the other retaining screw.

(d) Tighten slotted head screw and check tightness of the switch clamping nut.

3.3. Track Position Adjustment

(a) Remove side cover and slacken track fixing nuts.

(b) Move track so that when the slider is at zero on the scale the wipers are at the edge of the silver conductor beneath the track.
Note: This is approximately 3 mm from the end of the black resistance track.

(c) Move the slider along the track and check that the wiper fingers remain on the black resistance track at all times.

(d) Tighten track fixing nuts and replace side cover.

(e) Test attenuation law, noise and insertion loss.

SPARE PARTS FOR 1100 AND 1500 SERIES FADERS

P. 34513	Slider Block (Plastic)
P. 15229	Bush (PTFE)
P. 34428	Switch Operating Bracket
P. 34375	L/H End Block (Plastic)
P. 34376	R/H End Block (Plastic)
P. 34388	Guide Rod (Plastic End Blocks)
Screws	(For fixing side plate) - M2 x 6mm lg. CSK recess hd.Min.Qty 50
Screws	(For fixing top plate)-M2.5 x 8mm lg. CSK recess hd.Min.Qty 50
P. 15286	Rubber Stop
	Micro switch

P. 15227	Slider Block (Metal)
P. 15229	Bush (PTFE)
P. 15232	L/H End Block (Metal)
P. 15230	R/H End Block (Metal)
P. 15231	Guide Rod (Metal End Blocks)
Screws	(For fixing side plate) 8 BA CSK hd. x 3/16"lg. Min. Qty 50
Screws	(For fixing top plate) 8 BA CSK hd. x 3/16" lg. Min. Qty 50
P. 15286	Rubber Stop
	Micro switch

Painton Type 74/10/1556/10	Fixed Socket (Standard) Electrical
Painton Type 74/10/1506/10	Fixed Plug
Painton Type 74/10/1501/10	Mating Electrical Plug with cover (Standard)
Painton Type 74/10/1551/10	Mating Electrical Socket with cover
Screws	(For fixing black facias) 10BA x 1/8"lg.Inst.hd. Min. Qty 50
Screws	(For fixing silver facias) 10BA x 1/8" lg. Inst.hd.Min.Qty 50
Screws	(For fixing contact board to slider) M2 x 8mm lg. Recess Pan hd. (Min. Qty 50)
Top Plate	State size.
Facia	State size, style and finish (e.g. black lettering on silver or silver lettering on black)
Knobs	State color and width.
Tracks	State Fader Type - 1510, 1520, 1530 & resistance required.
Tracks	State Fader Type - 1522, 1532, 1540, 1550 & resistance required.
SA 15235	Contact Boards for type 1520 & 1530 faders.
SA 35155	Contact Boards for type 1510 fader.
SA 30442	Contact Boards for Type 1522, 1532, 1540 and 1550 faders.
	Other components on request.

SA 35084	Contact Boards for Type 1520 and 1530 faders when fitted with herringbone type track.

BROADCAST AUDIO CORPORATION

AUDIO DESIGN & MANUFACTURING

STANDARD REPLACEMENT PARTS LIST
AND SPARE PARTS KITS
June 1, 1986

PART #	DESCRIPTION	PRICE
300-0001	**VU Meter** (Specify Black or Amber)	$67.50
301-0001	VU Meter Bezel 3 1/2"	5.00
301-0002	VU Meter Bezel 2 1/2"	5.00
280-0001	**LCR** Audio Opto Isolator VTL5C1	4.80
280-0004	LCR Audio Opto Isolator VTL5C4 Mono Section	5.00
240-0005	**IC** LM 381 AN (Mixer)	6.20
240-0001	IC LF 351N (Mixer)	1.50
240-0010	IC CA 3183 AE (Mixer & Relay Board)	3.00
240-0006	IC LM 391N-80 (Old Line Amp Only)	6.75
240-0002	IC LF 356N (Line Amp)	2.50
240-0015	IC RC 4739DB (EQ Mixer) Series II	3.50
240-0030	IC TL072ACP (Op Amp)	2.50
240-0031	IC TL074ACN	3.60
240-0025	IC NE5532AN	3.50
240-0026	IC NE5534AN	5.40
240-0045	IC XR2206CP (Talkback)	14.75
240-0020	IC NE555N	2.00
240-0035	IC SN75468N	3.95
240-0060	IC CMOS D-A Converter AD 7111KN (System 14)	32.00
240-0055	IC Code Converter (System 14) CD4030CN	2.75
470-0001	**Transistor** RCA 120 (TIP 120)	2.00
470-0002	Transistor RCA 125 (TIP 125)	2.25
470-0015	Transistor (Monitor Board) (Series II) 2N4401	.50
470-0010	Transistor 2N3904	.60
470-0011	Transistor 2N3906	.60
470-0030	Transistor MPS A12	1.00
470-0035	Transistor MPS 8099	1.00
470-0036	Transistor MPS 8599	1.00
470-0040	Transistor GE D40D14	3.55
470-0041	Transistor GE D41D14	3.85
470-0020	**FET** 2N5462	1.10
470-0022	FET 2N5464 (Mixer) Use 2N5462	1.10
470-0025	FET MPF 4393	1.25
470-0050	FET Hitatchi 2SJ81	20.00
470-0051	FET Hitatchi 2SK225	20.00
340-0001	**Pot**--Monitor, Phones, Cue 10K	13.65
340-0006	Pot EQ CM Dual 100K 44044	18.00
340-0005	Pot Pan (System 20 & SERIES II) 10K CM 44043	24.50
340-0004	Pot Pan (SERIES IV) 10K CM45200	12.75
340-0007	Pot D/A 10K CM44227 D/A	6.90
340-0008	Pot Talkback 10K CM44556	10.50
170-0001	**Slide Pot** P & G 10K #1122 (System 20)	76.00
170-0002	Slide Pot P & G 10K #1122D with Detent (System 20)	93.50

170-0003	Slide Pot P & G 10K #3222D	76.00
BAA-3222	Retrofit Kit P & G #3222D (Waters to P & G)	99.50
170-0006	Slide Pot P & G 10K Digital (System 14)	85.00
170-0005	Slide Pot #4222C (SERIES IV)	78.00
270-0001	Lamp VU Meter #73	1.10
270-0002	Lamp On/Off Switch #382 (Replacement for #330)	1.25
270-0003	Lamp for Power Supply (AC)	2.50
270-0004	Lamp for Power Supply (DC)	2.50
370-0003	Regulator +5v MC78M05CT	4.40
370-0004	Regulator MLP15	4.40
370-0005	Regulator LM342 P15	3.50
445-0001	Button Off, Engraved (Mixer)	3.60
445-0002	Button On, Engraved (Mixer)	3.60
445-0011	Button, Plain Green	1.50
445-0012	Button, Plain Amber	1.50
445-0013	Button, Plain Blue	1.50
445-0014	Button, Plain White	1.50
445-0010	Button, Plain Red	1.50
-NONE-	Button, Special Engraved Buttons (1-14 pieces)	12.50
444-0001	Switch AC (Power Supply)	4.50
440-0001	Switch On/Off (Mixer) Less Button	11.25
440-0009	Switch Input (3 Position) SERIES II	21.50
440-0010	Switch Input 3 position (Series IV)	19.00
440-0011	Switch Output (5 Position) SERIES II	22.50
440-0012	Switch Output (5 Position) SERIES IV	24.75
440-0023	Switch (4 Position) Remote	10.75
440-0001	Switch (4 Position) Mode (System 20)	21.10
440-0013	Switch EQ (3 Position) SERIES IV	21.30
441-0003	Switch Mic/Line	7.40
441-0001	Switch 10db Boost & Cut SERIES II	7.35
440-0019	Switch Input (6 Position) System 20 "A"	18.50
440-0018	Switch Output (3 Position) System 20	9.80
440-0020	Switch Input (3 Position) System 20 "B & C"	11.20
441-0002	Switch 10 db Boost & Cut System 20	7.75
440-0014	Switch Monitor/Phones Select (6 Position)	15.00
440-0016	Switch Mono Meter Select	10.80
440-0015	Switch Mono Select (Systm 6)	7.20
445-0020	Bezel End (On/Off Switch)	.40
445-0021	Bezel Center (On/Off Switch)	.40
446-0001	Switch, Cue P & G Fader	7.50
440-0022	Switch, Cue "A" Mixer 002374	7.50
440-0021	Switch, Cue "B & C" Mixers 002375	7.50
290-0002	LED Green MV5453	1.75
290-0001	LED Red MV5754A	1.50
290-0003	LED Yellow MV5353	1.75
290-0015	LED Display CDA NSM 3916	28.00
290-0007	LED Green (Series IV Input)	1.65
290-0006	LED Red (Series IV EQ)	1.65
290-0008	LED Yellow (Cue)	2.25
290-0005	LED Red (Peak Level with Spacer)	1.75
461-0003	Transformer LP34-340	34.00
460-0001	Transformer Input T201SAS	18.85

460-0003	Transformer Input (SERIES IV) T201SAS-R	18.85
460-0005	Transformer Output (A-370/A-204B)	35.00
461-0001	Transformer (Monitor Amp) #1176	77.25
461-0002	Transformer (Phono Preamp) #1357	63.75
150-0005	Diode IN4005	.30
150-0025	Diode IN5404	1.70
150-0010	Diode IN4148	.25
150-0020	Diode IN5256B	.55
150-0001	Diode IN60	.80
260-0001	Knob P & G Slide Fader 11mm Black	2.50
260-0002	Knob P & G Slide Fader 11mm Red	2.50
260-0003	Knob P & G Slide Fader 11mm Orange	2.50
260-0004	Knob P & G Slide Fader 11mm Yellow	2.50
260-0005	Knob P & G Slide Fader 11mm Green	2.50
260-0006	Knob P & G Slide Fader 11mm Blue	2.50
260-0007	Knob P & G Slide Fader 11mm Grey	2.50
260-0008	Knob P & G Slide Fader 11mm White	2.50
260-0009	Knob P & G Slide Fader 16mm Black	2.50
260-0010	Knob P & G Slide Fader 16mm Red	2.50
260-0011	Knob P & G Slide Fader 16mm Orange	2.50
260-0012	Knob P & G Slide Fader 16mm Yellow	2.50
260-0013	Knob P & G Slide Fader 16mm Green	2.50
260-0014	Knob P & G Slide Fader 16mm Blue	2.50
260-0015	Knob P & G Slide Fader 16mm Grey	2.50
260-0016	Knob P & G Slide Fader 16mm White	2.50
260-0020	Knob Monitor, Phones, Cue	3.15
260-0030	Knob EQ & Pan Pots Black	3.45
260-0031	Knob Mode System 20	3.75
261-0005	Button Shadow Ivory (SERIES IV EQ)	.50
261-0006	Button Shadow Black (SERIES IV EQ)	.50
261-0001	Button Shadow Black (Rectangular)	.55
261-0002	Button Shadow White (Rectangular)	.55
261-0004	Button Shadow Grey (Rectangular)	.55
261-0007	Button Shadow Black (Round)	.45
341-0002	Trim Pot 1K (Peak Level Adjustment)	.75
341-0003	Trim Pot 10k (Meter Board)	.90
341-0020	Trim Pot 10K (Line Amp)	1.50
341-0011	Trim Pot 10K (Monitor Amp & Preamp)	.90
341-0004	Trim Pot 20K (Talkback Module, DA)	1.45
341-0012	Trim Pot 20K (System 20 Mixer)	.90
341-0005	Trim Pot 50K (SERIES II Mixer)	.90
341-0001	Trim Pot 500 OHM (System 5 Monitor Amp & Talkback) .	1.00
341-0015	Trim Pot 50K (Series IV Mixer)	.90
180-0001	Fuse Power Supply, 1A Slo Blo (Box of 5)	5.75
380-0001	Relay AZ 470	11.25
380-0002	Relay Socket	2.50
380-0003	Relay Clip	.30
490-0001	Shielded Audio Cable (per foot)	.45
135-0020	Connector EDAC 20 pin	7.35
135-0024	Connector EDAC 24 pin	8.20
135-0010	Connector EDAC 36 pin (Line Amp)	8.75
135-0036	Connector EDAC 36 pin (SERIES IV Mixer)	8.75

135-0060	Connector EDAC 60 pin	12.25
360-0001	Power Supply Module SERIES II 12v	69.95
360-0003	Power Supply Module SERIES IV 12v	79.95
360-0002	Power Supply Module SERIES II 30v	69.95
360-0004	Power Supply Module System 14 & 20 12v	99.95
360-0005	Power Supply Module System R, 14 & 20 18v	89.95
	Hinge Bolster Heavy Duty System 8/12	40.00
	Hinge Bolster Heavy Duty System 14	45.00
	Hinge Bolster Heavy Duty System 16	50.00
	Hingel Bolster Heavy Duty System 20	55.00

SERIES IV

240-0040	IC MIC Preamp SSM 2015	11.40
271-0001	Lamp Socket VU Meter	1.50
441-0002	Switch 10db Boost & Cut	6.00

P & G 4000 Fader Conversion in Old Series Consoles

P & G 4222C to Replace P & G 3222D in Series II

P & G 4222C Fader Less Knob (Set up for Series II 78.00

****

P & G 4222C to Replace Waters LM-6 of the P & G #3222D retrofit kit.

1 ea.	P & G 4222C Fader with 16mm Knob (Set up with SERIES II Plugs & Fish Paper	$78.00
1 ea.	New SERIES II Metal Module (only)	21.00
2 ea.	Fader mounting brackets with two 4-40 x 3/16 flat head screws plus retrofit instructions	6.00
BA-4222 Total		$105.00

PC BOARD ASSEMBLIES

BAA-2940	Mixer Extender Cards (SERIES II)	50.00
BA-4040	Mixer Extender Card (Systems 14 & 20)	62.50
BAA-2840	Mixer Extender Card (SERIES IV)	62.50
BAA-2950	Output Amplifier Extender Card (all)	25.00
BAA-3100	Monitor/Phones Selector Switch Asssy	65.00
BAA-3140	Monitor Pot Assy	55.00
BAA-4007	Output Amplifier (SERIES II,IV, Systems 14 & 20) ..	75.00
BAA-5004	Output Amplifier (Systems 5 & R)	75.00
BAA-5005	Mono Mic Input Card (System 5)	50.00
BAA-5000	Stereo Mic Input Card (System R)	65.00
BAA-5007	10K Transformer Input Card (System 5 & R)	50.00
BAA-5006	10K Active Bridging Input Card (System 5 & R)	50.00
BAA-5107	VCA Card (System R)	135.00
BAA-4102	MOS FET 35 Watt Monitor Amplifier Card	175.00
BAA-4502	Phono Preamplifier Card	185.00
BAA-4303	Distribution Amplifier Card	175.00
BAA-2935	SERIES II, System 8 Relay Board Extender	375.00
BAA-2931	SERIES II, System 12 Relay Board Extender	590.00
BAA-2930	SERIES II, System 16 Relay Board Extender	525.00
BAA-2962	System 6 Plug-in Relay Option	300.00

SPARE PARTS KIT SERIES II

****

BAA-0802 Kit #1 ..... $100.00

2 each	LM381AN	4 each	LF35IN
4 each	CA3183AE	2 each	KF356N
3 each	TIP 120	2 each	TIP 125
4 each	LCR's	10 each	#73 Lamps
10 each	#382 Lamps	1 each	Off/On Switch

****

BAA-0803 Kit #2 ..... $180.00

Same as Kit #1 Plus 1 each P & G #3222D Slide Pot

****

BAA-0804 Kit #3 ..... $260.00

Same as Kit #1 Plus 2 each P & G #3222D Slide Pots

****

BAA-0805 Kit #4 ..... $360.00

Same as Kit #3 Plus 1 Each Mixer Extender Card
1 each Line Amp Extender Card

****

SPARE PARTS KIT SYSTEM 20

****

BAA-2001 Kit #1..... $150.00

1 each	SN75468N	3 each	LF356N
3 each	NE5532AN	2 each	TL072CP
2 each	TL074CN	4 each	MPF 4393
2 each	TIP 120	2 each	TIP 125
2 each	LM320MLP15	2 each	LM342P15
10 each	#73 Lamps	10 each	#382 Lamps
4 each	LCR's	2 each	MPS 8099
2 each	MPS 8599		

****

BAA-2002 Kit #2 ..... $225.00

Same as Kit #1 Plus 1 each P & G Slide Pot

****

BAA-2003 Kit #3 ..... $200.00

2 each	SN75468N	4 each	LF 356N
4 each	NE5532AN	4 each	NE5534AN
2 each	TL072CP	4 each	TL074CN
2 each	TIP 120	2 each	TIP 125
3 each	LM320MLP15	3 each	LM342P15
10 each	#73 Lamps	10 each	#382 Lamps
5 each	LCR's	5 each	MPS 8099
5 each	MPS 8599		

NOTE: Recommended for console with more than five "A" mixers or consoles with more than twelve mixers total.

****

BAA-2004 Kit #4 ..... $275.00

Same as Kit #3 Plus 1 each P & G Slide Pot

****

BAA-2005 Kit #5 ..... $400.00

Same as Kit #4 Plus 1 each Mixer Extender Card
1 each Line Amp Extender Card

****

SPARE PARTS KIT SERIES IV

****

BAA-1604 Kit #1 ..... $100.00

2 each	LCR VTL5C1	6 each	NE5532AN
4 each	NE555N	2 each	SSM2015
2 each	TIP 120	2 each	TIP 125
2 each	LF356N	5 each	#73 Lamps
10 each	#382 Lamps	4 each	Green LED (Input)
2 each	Yellow LED (Cue)	1 each	On/Off Switch

****

BAA-1605 Kit #2 ..... $175.00

Same as Kit #1 Plus 1 each P & G #4222D Slide Pot

****

BAA-1606 Kit #3 ..... $250.00

Same as Kit #1 Plus 2 each P & G #4222D Slide Pots

****

BA-1607 Kit #4 ..... $350.00

Same as Kit #3 Plus 1 each Mixer Extender Card
1 each Output Amp Extender Card

****

BAA-1608 Kit #5 ..... $25.00

2 each Peak Level LED (Red) 2 each TL072

NOTE: FOR CONSOLES WITH PEAK LEVEL INDICATORS

****

BAA-1609 Kit #6 ..... $50.00

4 each Red LED (EQ) 1 each 10K Pan Pot
1 each 50K EQ Pot

NOTE: FOR CONSOLES WITH PEAK LEVEL INDICATORS

****

SPARE PARTS KIT SERIES IV (continued)

****

Input & Patch Point Connector Kits

BAA-6000	System 6	$40.00
BAA-8000	System 8	50.00
BAA-1200	System 12	60.00
BAA-1600	System 16	80.00
BAA-2000	System 20	100.00

NOTE: All connector Kits are less crimpers.

BAA-6040 Distribution Amplifier (per card) 2.50

****

POWER ONE INC.
CALIPLANO, CA
1-805-987-8741

POWER SUPPLIES IN THE BROADCAST AUDIO BOARD ARE MADE BY POWER ONE.
THE MODEL # FOR THE +/-18 VOLT SUPPLY IS HN24-3.6
(THEY HAVE ADDED AN 'A' INTO THIS NOW, BUT IS SUPPOSED TO BE THE SAME SIZE. **NOTE THAT THIS IS A 24 VOLT SUPPLY THAT WE MUST FIELD MODIFY FOR 18 VOLTS. SEE THE BROADCAST AUDIO/POWER ONE SHEET SCHEMATIC FOR DETAILS. IT INVOLVES ADDING A 5K6 RESISTOR.**

LIST PRICE IS $73.10

SOME LOCAL DISTRIBUTORS (NONE IN 914 OR 212):

PIONEER STANDARD
1-516-921-8700

R.S. ELECTRONICS
1-516-231-3313

CAPSTONE ELECTRONICS (LONG ISLAND)
1-800-388-2277

ABOVE INFO PER KATRINA@POWER ONE 7/2/96

I also have info on the power supplies.

They use 2 power supplies, originally built as 24 volts at 3.6 amps but modified down to 18 volts each.
The 2 power supplies are made by Power One, part # HN24-3.6-AG. DigiKey has many in stock at about $73 each. Now the notes I have is that they are modified down to 18 volts from 24 volts by adding a 5K6 (5600) ohm resistor somewhere in the supply. Looking at it closer, there is a 5600 ohm small 1/2 watt or smaller resistor in parallel directly across a resistor. The component number of the resistor it is parallel across is hidden by the 2 large electrolytics above it, but it is the third resistor up in line from the negative (-) output terminals and under the filter caps and next to a metal trimpot marked R11 V ADJ. Also it is next to C4 a ceramic cap and just before R13 and U1.

You take two of these supplies to make + and - 18 volts.
A datasheet on the original 24 volt supply is here:
http://www.power-one.com/resources/products/datasheet/lin.pdf
A parts page link from a distributor is here:
http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail?name=179-2347-ND

Funny thing is these listed for $73.10 back in July 1996 and are now $72.83 each in 2008.