

# INSTRUCTION MANUAL

**SW5E SWITCHER  
SW5F SWITCHER**

January, 1993

IM No. 597-5350

BROADCAST ELECTRONICS, INC.



# **IMPORTANT INFORMATION**

## **EQUIPMENT LOST OR DAMAGED IN TRANSIT**

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage **WITHIN 15 DAYS** after receipt. Claims for loss or damage will not be honored without proper notification of inspection by the carrier.

## **TECHNICAL ASSISTANCE AND REPAIR SERVICE**

Technical assistance is available from Broadcast Electronics by letter or prepaid telephone or telegram. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured and well protected. Do not mail equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact Customer Service Department for a Return Authorization.

### **FOR TECHNICAL ASSISTANCE**

Phone (217) 224-9600 Customer Service

## **WARRANTY ADJUSTMENT**

Broadcast Electronics, Inc. warranty is included in the Terms and Conditions of Sale. In the event of a warranty claim, replacement or repair parts will be supplied F.O.B. factory. At the discretion of Broadcast Electronics, the customer may be required to return the defective part or equipment to Broadcast Electronics, Inc. F.O.B. Quincy, Illinois. Warranty replacements of defective merchandise will be billed to your account. This billing will be cleared by a credit issued upon return of the defective item.

## **RETURN, REPAIR AND EXCHANGES**

Do not return any merchandise without our written approval and Return Authorization. We will provide special shipping instructions and a code number that will assure proper handling and prompt issuance of credit. Please furnish complete details as to circumstances and reasons when requesting return of merchandise. All returned merchandise must be sent freight prepaid and properly insured by the customer.

## **REPLACEMENT PARTS**

Emergency and Warranty Replacement Parts may be ordered from the address below. Be sure to include equipment model and serial number and part description and part number. Non-Emergency Replacement Parts may be ordered directly from the Broadcast Electronics stock room by Fax at the number shown below.

### **EMERGENCY AND WARRANTY REPLACEMENT PARTS**

Broadcast Electronics, Inc.  
4100 N. 24th St., P.O. Box 3606  
Quincy, Illinois 62305  
Tel: (217) 224-9600  
Telex: 25-0142  
Fax: (217) 224-9607

### **NON-EMERGENCY REPLACEMENT PARTS**

Fax: (217) 224-9609

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## **MODIFICATIONS**

Broadcast Electronics, Inc. reserves the right to modify the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

## SW5E/F SWITCHER

	<u>PART NO.</u>	<u>DESCRIPTION</u>
SW5E	904-5000	Audio switcher for one 5300 series, one 5400 series, three 3000 series, or three 2100 series cartridge machines.
SW5F	904-5001	Audio switcher for one 5500 series, five 3000 series, or five 2100 series cartridge machines.

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SECTION I  
GENERAL INFORMATION

1-1. EQUIPMENT DESCRIPTION.

1-2. The Broadcast Electronics SW5E Switcher is a three-input model which is designed for one 5300 Series, one 5400 Series, three 3000 Series, or three 2100 Series cartridge machines. The SW5F Switcher is a five-input model which is designed for one 5500 Series, five 3000 Series, or five 2100 Series cartridge machines. Both accept audio output signals from all decks of the appropriate machine and provide a single balanced output from the last started deck. All other decks are muted. The switcher is controlled by logic signals already existing in the cartridge machines.

1-3. All power for switcher operation is derived from the companion cartridge machine. The switcher is activated when power is applied to the associated cartridge machine. Audio from the last started deck will be applied to the switcher output terminals. Starting a new deck will automatically mute audio from the previously playing deck and output audio from the newly started deck. If the wrong deck is started, depressing another deck start switch will automatically mute audio from the incorrect deck and supply audio from the newly started one. The incorrectly started deck will then recue.

1-4. Up to three SW5E/F Switchers may be connected in parallel to provide a single audio output from up to 9 cartridge decks for the SW5E and 15 cartridge decks for the SW5F.

1-5. PHYSICAL SPECIFICATIONS.

1-6. Refer to Table 1-1 for physical specifications of the SW5E/F Switchers.

TABLE 1-1. PHYSICAL SPECIFICATIONS

PARAMETER	SPECIFICATIONS
DIMENSIONS:	
WIDTH	10.0 Inches (25.4 cm).
HEIGHT	
Without Connectors	2.5 Inches (6.35 cm).
With Connectors	5.5 Inches (13.97 cm).
DEPTH	8.0 Inches (20.32 cm).
WEIGHT	2 Lbs. 4 Ozs. (1.97 kg) unpacked.
MAXIMUM OPERATING TEMPERATURE	90°F (30.3°C).

## SECTION II INSTALLATION

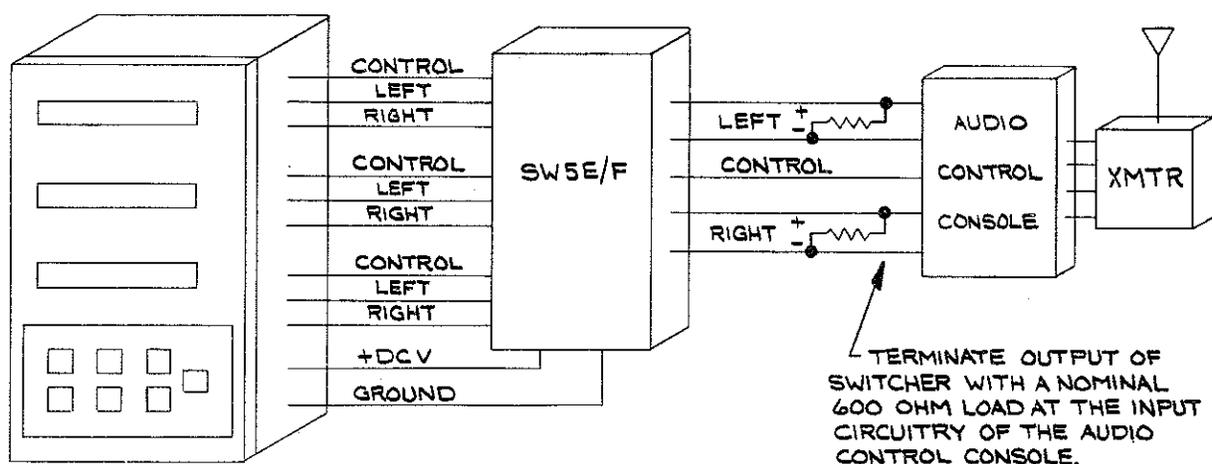
### 2-1. INSTALLATION.

2-2. Carefully unpack the system equipment. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged.

2-3. The contents of the shipment should be as indicated on the packing list. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and Broadcast Electronics, Inc.

2-4. The SW5E/F Switchers are normally mounted out of sight (i.e. inside a desk or cabinet). Ventilation must be provided as required to prevent ambient temperature from exceeding 90°F (30.3°C) for best operation.

2-5. All input signals from the cartridge machine which are not switched to the output bus are terminated in the switcher in a nominal 600 Ohm load. No termination is provided on the switcher output bus. This line must be terminated in a nominal 600 Ohm load at the input of the device to which the switcher is connected (see Figure 2-1 for typical installation).



#### NOTES:

1. FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
2. FOR SINGLE DECK MACHINE USE THE CONNECTION FOR ONLY ONE DECK

597-5350-1

FIGURE 2-1. TYPICAL SINGLE SW5E/F SWITCHER INSTALLATION

2-6. INTERCONNECTIONS.

2-7. Two 24-pin connectors provide input and output connections to and from the switcher. Interconnections between the SW5E and a companion cartridge machine are shown in the following drawings:

1. 906-5120 for 5300, 5300A, and 5300B cartridge machines.
2. 597-5350-25 for 5300C and all 5400 series cartridge machines.
3. 906-3143 for the 3000 series cartridge machines.
4. 597-5350-4 for the 2100 series cartridge machines.

Interconnections between the SW5F and a companion cartridge machine are shown in the following drawings:

1. 906-5121 for the 5500 series cartridge machines.
2. 906-3143 for the 3000 series cartridge machines.
3. 597-5350-4 for the 2100 series cartridge machines.

2-8. Up to three switchers may be interconnected to provide a single output from a like number of cartridge machines (see Figure 2-2 and notes 4 and 5 on drawings 906-5120, 906-5121, 906-3143, 597-5350-4, and 597-5350-25. Connect the switcher audio outputs in parallel. Then connect the cancel buses in parallel. This forms a single audio output which is then connected to a controller (i.e. audio console, etc.).

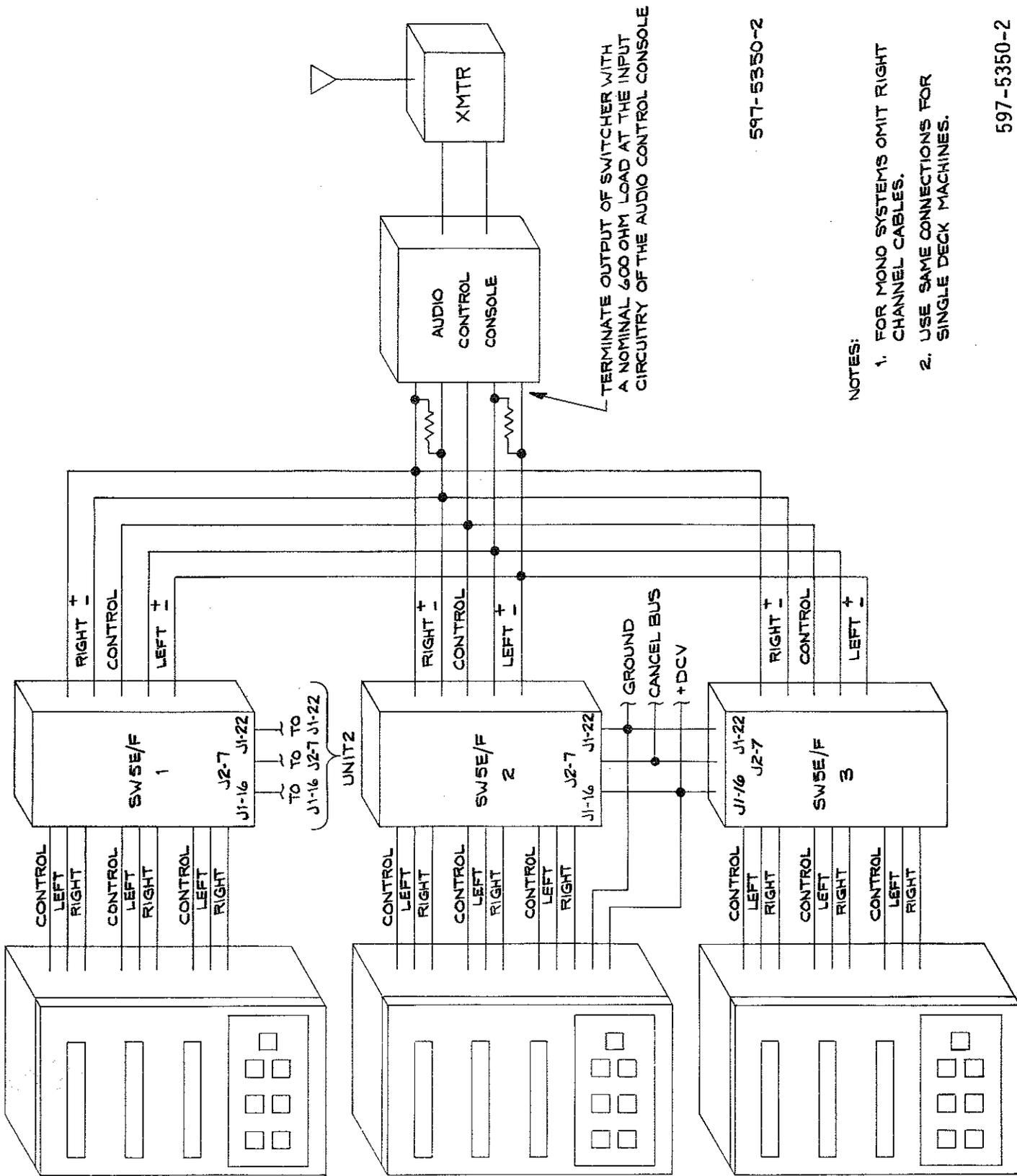
2-9. All power is derived from the companion Broadcast Electronics cartridge machine. If more than one machine is used, power is to be derived from only one machine.

### SECTION III OPERATION

3-1. OPERATION.

3-2. Insert a tape cartridge into the desired deck and depress the corresponding start switch. The cartridge will start and audio from the started deck will be routed through the switcher. All other decks will be muted.

3-3. To start another deck, depress the corresponding start switch. The switcher will output audio from this deck and mute the previous deck. If a deck is started in error, simply start the correct deck and the erroneously started deck will recue.



597-5350-2

NOTES:

1. FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
2. USE SAME CONNECTIONS FOR SINGLE DECK MACHINES.

597-5350-2

FIGURE 2-2. TYPICAL MULTIPLE SW5E/F SWITCHER INSTALLATION

SECTION IV  
THEORY OF OPERATION

4-1. SYSTEM COMPONENTS.

4-2. The switchers consists of an aluminum chassis which houses a single circuit board. The circuit board contains elements for:

1. The +18V dc regulator.
2. Relays and output bus circuitry for switching cartridge deck audio input signals to the output bus.
3. Solid state logic which controls the relays.

4-3. Two 24-Pin connectors located on the top surface of the SW5E/F assembly provide input and output connections to the unit. Mating plugs for these connectors are supplied with each switcher.

4-4. FUNCTIONAL DESCRIPTION.

4-5. POWER REGULATOR.

4-6. Refer to schematic 906-5114 for the following discussion.

4-7. The power regulator as shown in schematic 906-5114, is a conventional series regulator which reduces the +28V from the cartridge machine to a regulated +18V. Series regulated transistor Q1 is controlled by the voltage developed across zener diode CR2.

4-8. RELAY CIRCUIT.

4-9. Three relays are used for the SW5E Switcher and five for the SW5F. Two groups of relay contacts are used on all units, one for the left channel, and one for the right channel. Only the left channel is used for monophonic units. Balanced line switching is employed, and all input lines are terminated in a nominal 600 Ohm load when not switched to the output bus. No termination is provided on the switcher output bus (refer to Figure 2-1).

4-10. Relays K1 through K3 for the SW5E (K1 through K5 for the SW5F) are deenergized. A start verify pulse from the cartridge machine deck energizes a flip-flop which biases on a corresponding transistor and relay. This action switches the input audio signal to the output bus and mutes all other decks.

4-11. LOGIC CIRCUIT.

4-12. Refer to Figure 4-1 for the following discussion. All decks, relays, and integrated circuits operate in an identical manner.

4-13. The logic circuit consists of five flip-flops implemented from two cross-connected NAND gates. When power is applied to the associated cartridge machine, dc voltage will be applied to the elements of the switcher. This momentarily biases on transistor Q7 which allows current flow through diode CR8 which resets all five flip-flops to the off state (LOW) and deenergizes all relays. All flip-flops will remain in this preset condition until an appropriate start logic signal from the cartridge machine sets one flip-flop into its complementary state.

4-14. The signal that triggers the flip-flops state is the start verify signal from the logic circuit board of the started deck. This signal is applied through two resistors (R30 and R31) and capacitor C12. This circuit extends the duration of the start signal to assure that the start signal will not be terminated by a signal from the cancel control bus. This action applies the start signal to the set input of the flip-flop IC 3A/B and triggers the flip-flop to the on state (HIGH) which biases on transistor Q6 and energizes relay K5. The closure of K5 applies the input audio signal to the switcher output bus.

4-15. When transistor Q6 is biased on, a pulse generated by the discharge of capacitor C13 is applied to the cancel control bus. This pulse is then applied to the base of transistor Q8, biasing Q8 off. This in turn biases on transistor Q9 which applies a LOW pulse to the cancel bus and to the five flip-flops. The effect of this action resets any flip-flop that is in the on state (HIGH) to its alternate off state (LOW), deenergizing any relays that are connected to the output bus. This cancelling pulse is short as compared to the start verify pulse which ensures that a started cartridge will not be stopped during this cancelling action.

## SECTION V MAINTENANCE

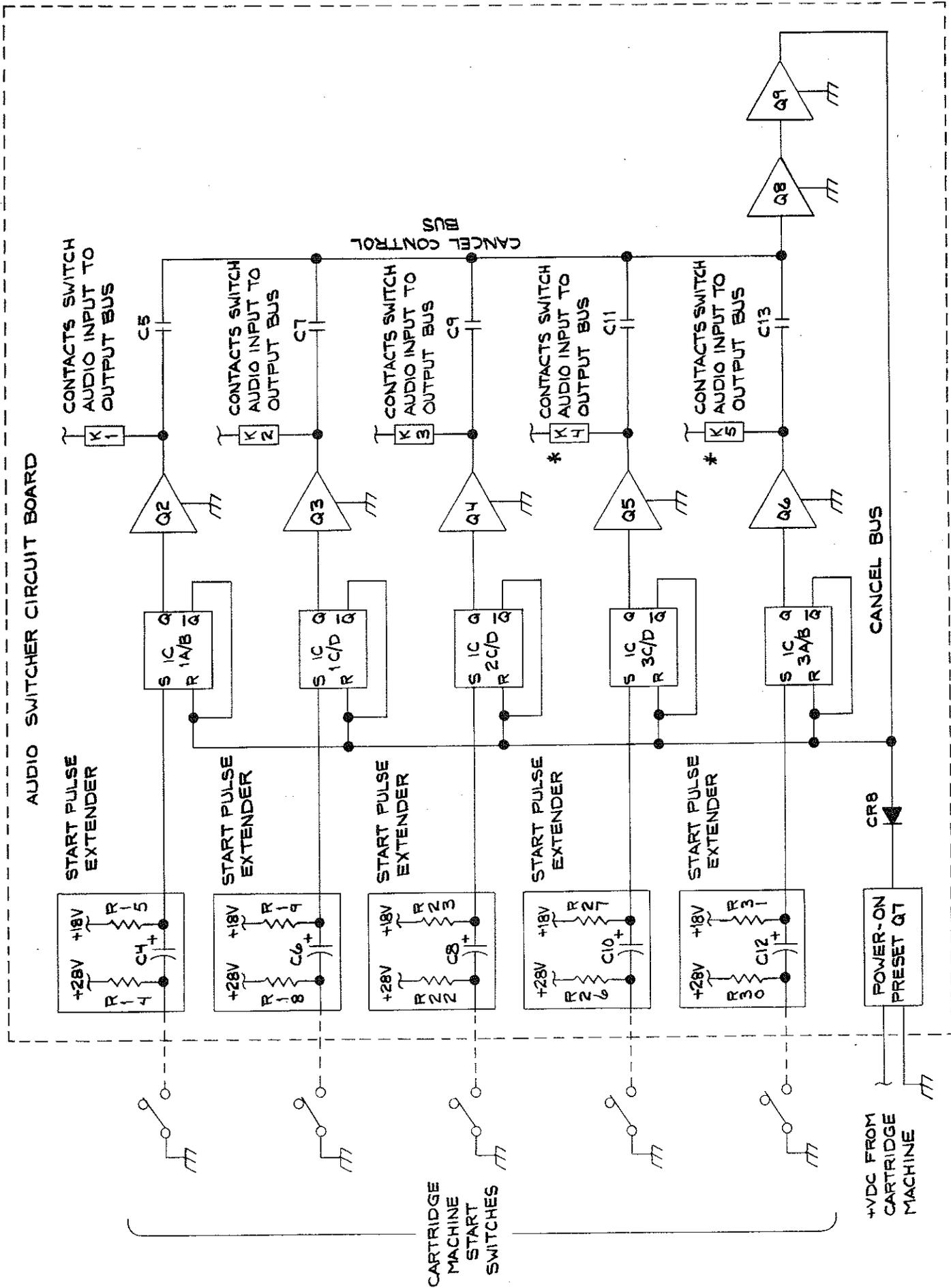
5-1. This section provides general maintenance and parts replacement information for the SW5E/F Switchers.

5-2. SAFETY CONSIDERATIONS.

5-3. Always disconnect the main power source from the machine before removing the covers and other components. Good judgement, care, and common sense are the best accident preventives. The procedures contained in this section should be performed only by trained and experienced maintenance personnel.

5-4. COMPONENT LOCATION.

5-5. Locations of circuit board components are shown in the assembly drawings accompanying the schematics and parts lists.



597-5350-3

\* K4 AND K5 NOT SUPPLIED WITH THE SWISE  
 FIGURE 4-1. SWITCHER BLOCK DIAGRAM

**WARNING:** DISCONNECT POWER PRIOR TO SERVICING

WARNING

ALWAYS DISCONNECT THE MAIN POWER FROM THE MACHINE BEFORE REMOVING THE COVERS, CIRCUIT BOARDS, OR OTHER COMPONENTS. DO NOT REMOVE OR INSERT CIRCUIT BOARDS WHILE POWER IS SUPPLIED TO THE MACHINE.

WARNING

WARNING

5-6. COMPONENT REPLACEMENT.

5-7. The circuit board used in the SW5E/F Switchers is double-sided with plated-through holes. Because of the plated-through holes, solder fills the holes by capillary action. These conditions require that defective components be removed to avoid damage to the circuit board.

5-8. On all circuit boards, the adhesion of the copper trace to the board fails at almost the same temperature as solder melts. A circuit board trace can be destroyed by excessive heat or lateral movement during soldering. Use of a small iron with steady pressure is required for circuit board repairs.

5-9. To remove a component other than the plug-in type from a circuit board, cut the leads from the body of the defective component while the device is still soldered to the board.

5-10. Grip each component lead, one at a time, with long nose pliers. Turn the board over and touch the soldering iron to the lead at the solder connection. When the solder begins to melt, push the lead through the back side of the board and cut off the clinched end of the lead. Each lead may now be heated independently and pulled out of each hole. The holes may be cleared of solder by carefully re-heating with a low wattage iron and removing the residual solder with a soldering vacuum tool.

5-11. Install the new component and apply solder from the bottom side of the board. If no damage has been done to the plated-through holes, soldering of the top side is not required.

WARNING

MOST SOLVENTS WHICH WILL REMOVE ROSIN FLUX ARE VOLATILE AND TOXIC BY THEIR NATURE AND SHOULD BE USED ONLY IN SMALL AMOUNTS IN A WELL VENTILATED AREA, AWAY FROM FLAME, CIGARETTES, OR HOT SOLDERING IRONS.

WARNING

WARNING

WARNING

OBSERVE THE MANUFACTURER'S CAUTIONARY INSTRUCTIONS.

5-12. After soldering, remove residual flux with a cotton swab moistened with a suitable solvent. Rubbing alcohol is highly diluted and is not effective. Solvents are available from electronic supply houses which are useful.

5-13. The board should be checked to ensure the flux has been removed and not just smeared about. Rosin flux is not normally corrosive, but it will absorb enough moisture in time to become conductive and cause problems.

5-14. INTEGRATED CIRCUITS. Extra care should be exercised with integrated circuits. All integrated circuits must be oriented so that its notch matches the notch on the socket for replacement. Do not attempt to remove an integrated circuit with your fingers. Use a circuit puller to lightly pry the circuit from its socket.

SECTION VI  
PARTS LIST

6-1. INTRODUCTION.

6-2. This section provides descriptions, part numbers, and assemblies required for maintenance of the SW5E/F Switchers. The tables in this section is indexed by the reference designators of the applicable schematic diagram.

TABLE 6-1. FINAL ASSEMBLY, SW5E - 904-5000

REF. DES.	DESCRIPTION	PART NO.	QTY.
P1	Connector, Cinch	418-0309	1
P2	Connector, Cinch	418-0306	1
----	Audio Switcher Circuit Board Assembly	914-1822	1

TABLE 6-2. FINAL ASSEMBLY, SW5F - 904-5001

REF. DES.	DESCRIPTION	PART NO.	QTY.
K4,K5	Relay, 4PDT, Plug-in Coil: 24V dc, 700 Ohms Contacts: 4PDT, 2 Amperes	270-0007	2
----	Spring, Hold Down	270-0017	2
P1	Connector, Cinch	418-0309	1
P2	Connector, Cinch	418-0306	1
----	Audio Switcher Circuit Board Assembly	914-1822	1

TABLE 6-3. AUDIO SWITCHER CIRCUIT BOARD ASSEMBLY SW5E/F - 914-1822

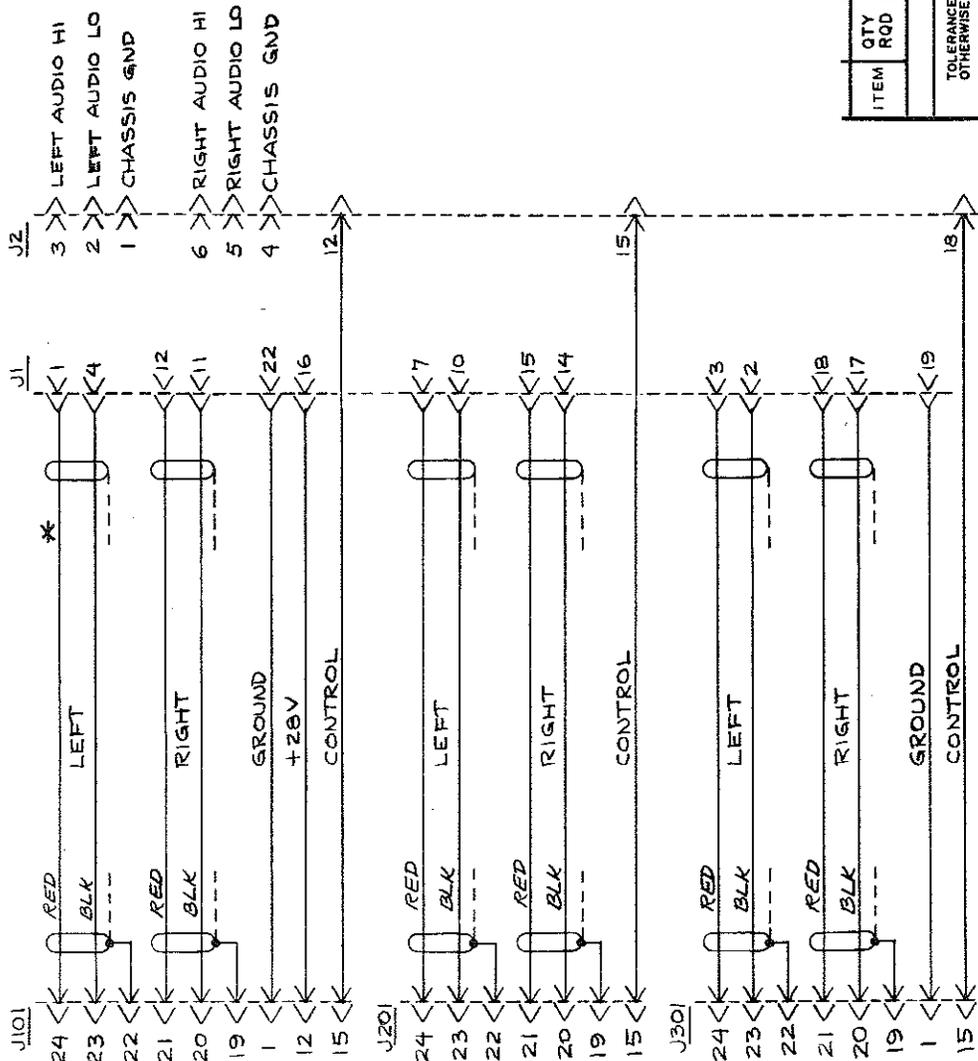
REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C2,C3	Capacitor, 4.7 uF, 35V, Tantalum	064-4763	2
C4	Capacitor, Electrolytic, 3.3 uF, 50V	024-3364	1
C5	Capacitor, Mica, 270 pF ±5%, 300V	041-2722	1
C6	Capacitor, Electrolytic, 3.3 uF, 50V	024-3364	1
C7	Capacitor, Mica, 270 pF ±5%, 300V	041-2722	1
C8	Capacitor, Electrolytic, 3.3 uF, 50V	024-3364	1
C9	Capacitor, Mica, 270 pF ±5%, 300V	041-2722	1
C10	Capacitor, Electrolytic, 3.3 uF, 50V	024-3364	1
C11	Capacitor, Mica, 270 pF ±5%, 300V	041-2722	1
C12	Capacitor, Electrolytic, 3.3 uF, 50V	024-3364	1
C13	Capacitor, Mica, 270 pF ±5%, 300V	041-2722	1
C14	Capacitor, Electrolytic, 33 uF, 35V	024-3335	1
CR1	Diode, 1N4005, Silicon, 600V, 1 Ampere	203-4005	1
CR2	Diode, Zener, 1N4744A, 15V, 1W	200-0015	1
CR3 THRU CR7	Diode, 1N4005, Silicon, 600V, 1 Ampere	203-4005	5
CR8	Diode, 1N4148, Silicon, 75V, 10 mA	203-4148	1
IC1 THRU IC3	Integrated Circuit, 74COON, Quad 2-Input NAND Gate, 14-Pin DIP	221-7400	3
J1	Connector, 24-Pin	418-0311	1
J2	Connector, 24-Pin	417-0302	1
K1 THRU K3 (SW5E Only)	Relay, 4PDT, Plug-in Coil: 24V dc, 700 Ohms Contacts: 4PDT, 2 Amperes	270-0007	3
----	Spring, Hold Down (for K1, K2, K3)	270-0017	3
Q1 THRU Q9	Transistor, GES-5816, Silicon, NPN, TO-18 Case	211-5816	9
R1 THRU R10	Resistor, 620 Ohm ±5%, 1/4W	100-6233	10
R11	Resistor, 1 Ohm ±5%, 1/2W	110-1013	1
R12	Resistor, 330 Ohm ±5%, 1/2W	110-3333	1
R13	Resistor, 3.3 k Ohm ±5%, 1/4W	100-3343	1
R14 THRU R37	Resistor, 10 k Ohm ±5%, 1/4W	100-1053	24
R38,R39	Resistor, 100 k Ohm ±5%, 1/4W	100-1063	2
R40	Resistor, 10 k Ohm ±5%, 1/4W	100-1053	1
XIC1 THRU XIC3	Socket, 14-Pin	417-1400	3
XK1 THRU XK5	Socket, Relay (for K1, K2, K3, K4, K5)	270-0008	5
----	Connector, 24-Pin	418-0303	1
----	Connector, 24-Pin	418-0310	1
----	Blank Circuit Board	514-1812	1

SECTION VI  
DRAWINGS

7-1. INTRODUCTION.

7-2. This section provides assembly drawings, schematic diagrams, and wiring interconnections as indexed below.

<u>FIGURE</u>	<u>TITLE</u>	<u>NUMBER</u>
7-1	OVERALL SCHEMATIC DIAGRAM	D906-5114
7-2	SW5E/F AUDIO SWITCHER CIRCUIT BOARD ASSEMBLY	C914-1822
7-3	CABLE CONNECTIONS FOR 5300, 5300A, AND 5300B CARTRIDGE MACHINES	B906-5120
7-4	CABLE CONNECTIONS FOR 5500 SERIES CARTRIDGE MACHINES	C906-5121
7-5	CABLE CONNECTIONS FOR 3000 SERIES CARTRIDGE MACHINES	C906-3143
7-6	CABLE CONNECTIONS FOR 2100 SERIES CARTRIDGE MACHINES	597-5350-4
7-7	CABLE CONNECTIONS FOR 5300C AND 5400 SERIES SERIES CARTRIDGE MACHINES	597-5350-25



J2  
 3 >> LEFT AUDIO HI  
 2 >> LEFT AUDIO LO  
 1 >> CHASSIS GND  
 6 >> RIGHT AUDIO HI  
 5 >> RIGHT AUDIO LO  
 4 >> CHASSIS GND  
 12 >>

NOTES:

1. FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
2. \* CABLES TO BE BELDEN 8451 OR EQUIVALENT.
3. J1 & J2 ARE ON SWITCHER CARD; J101, J201 & J301 ARE ON REAR OF 3 DECK UNIT.
4. TO PARALLEL MORE THAN ONE MACHINE:
  - A. CONNECT SWITCHER OUTPUTS TOGETHER
  - B. CONNECT A WIRE BETWEEN J2-7 OF EACH SWITCHER
  - C. CONNECT A WIRE BETWEEN J1-22 OF EACH SWITCHER
5. POWER MUST BE MAINTAINED ON EACH MACHINE TIED TOGETHER FOR PROPER OPERATION.

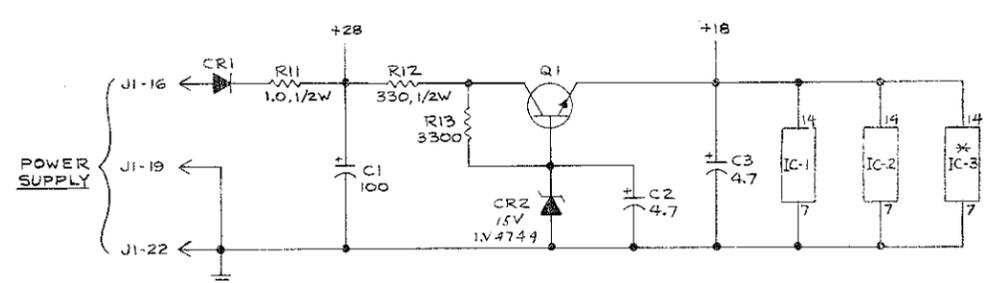
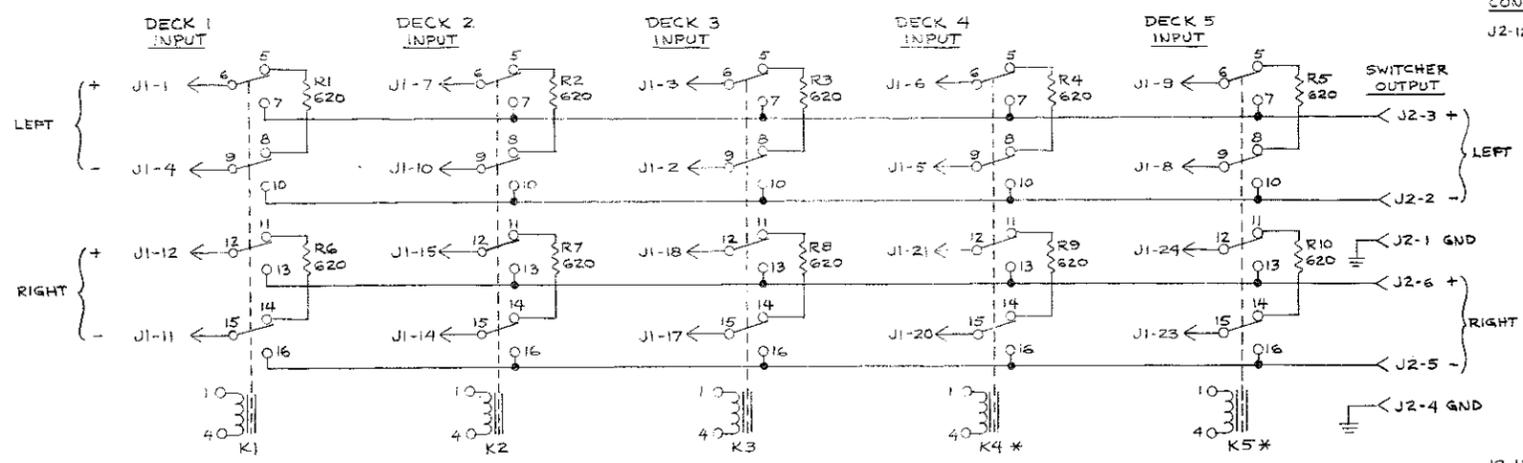
6. SEE B/M #904-5000

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE	DATE	DATE
DECIMAL 2 PL-DI 3PL-005		3/3/76	4-1-76	
FRACTIONAL 1/164		BY	BY	BY
FRAGILE TO		ENGR	ENGR	ENGR
BEND RADIUS		APPROVED	APPROVED	APPROVED
FILLET RADIUS		TREATMENT OR FINISH		
MATERIAL		CABLE CONNECTIONS		
		3 DECK STEREO SWITCHER		
		DWG NO. 906-5120		
		REV A		
		CABLE CONNECTIONS SCALE		
		FOR 5300B		
		SHEET 1 OF 1		

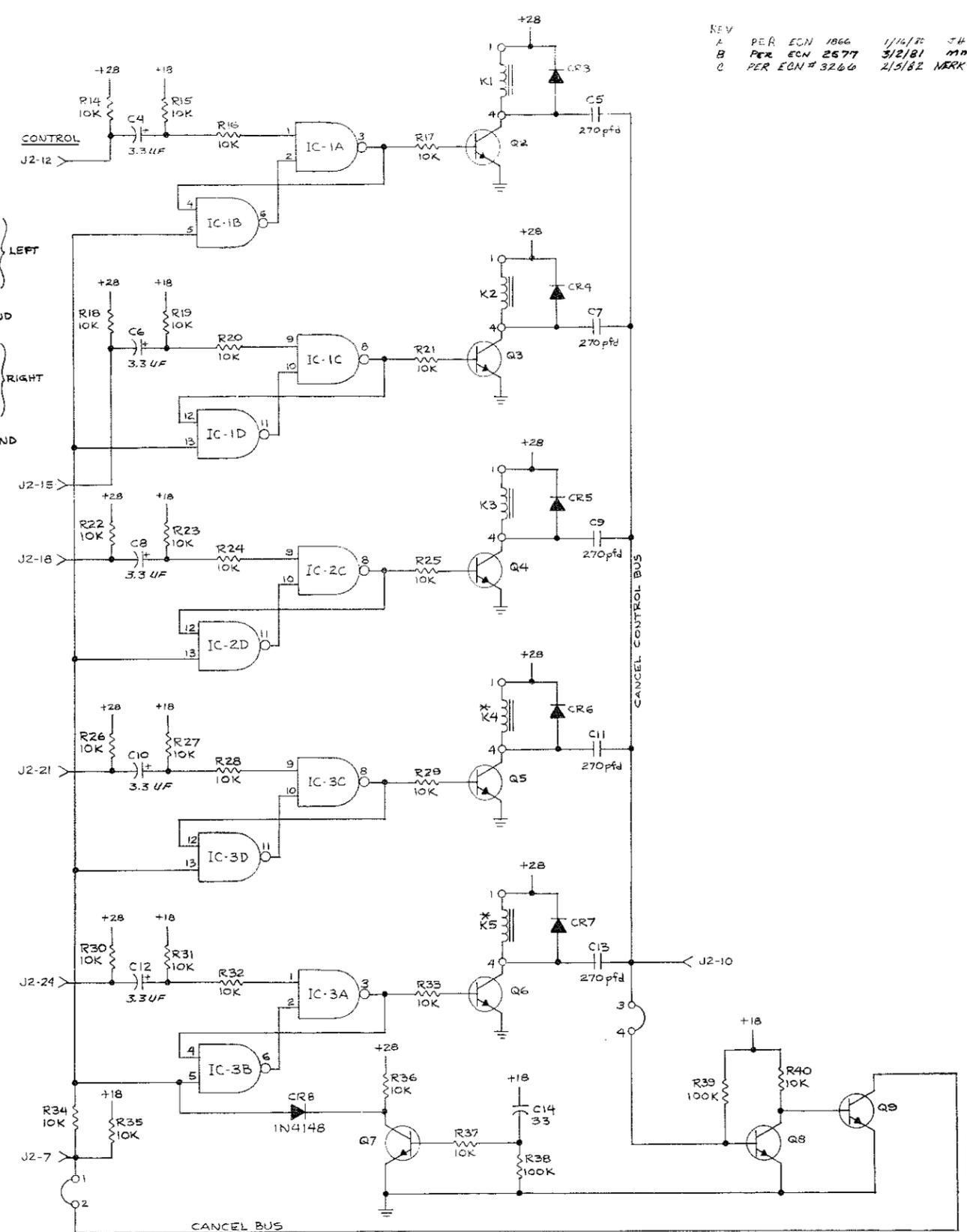
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 - A FILMWAYS COMPANY -

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 PERSONNEL AND CUSTOMERS  
 ALL RIGHTS RESERVED

REV  
 A PER EGN 1866 1/16/76 JH  
 B PER EGN 2577 3/2/81 MM  
 C PER EGN # 3266 2/5/82 MARK SJ



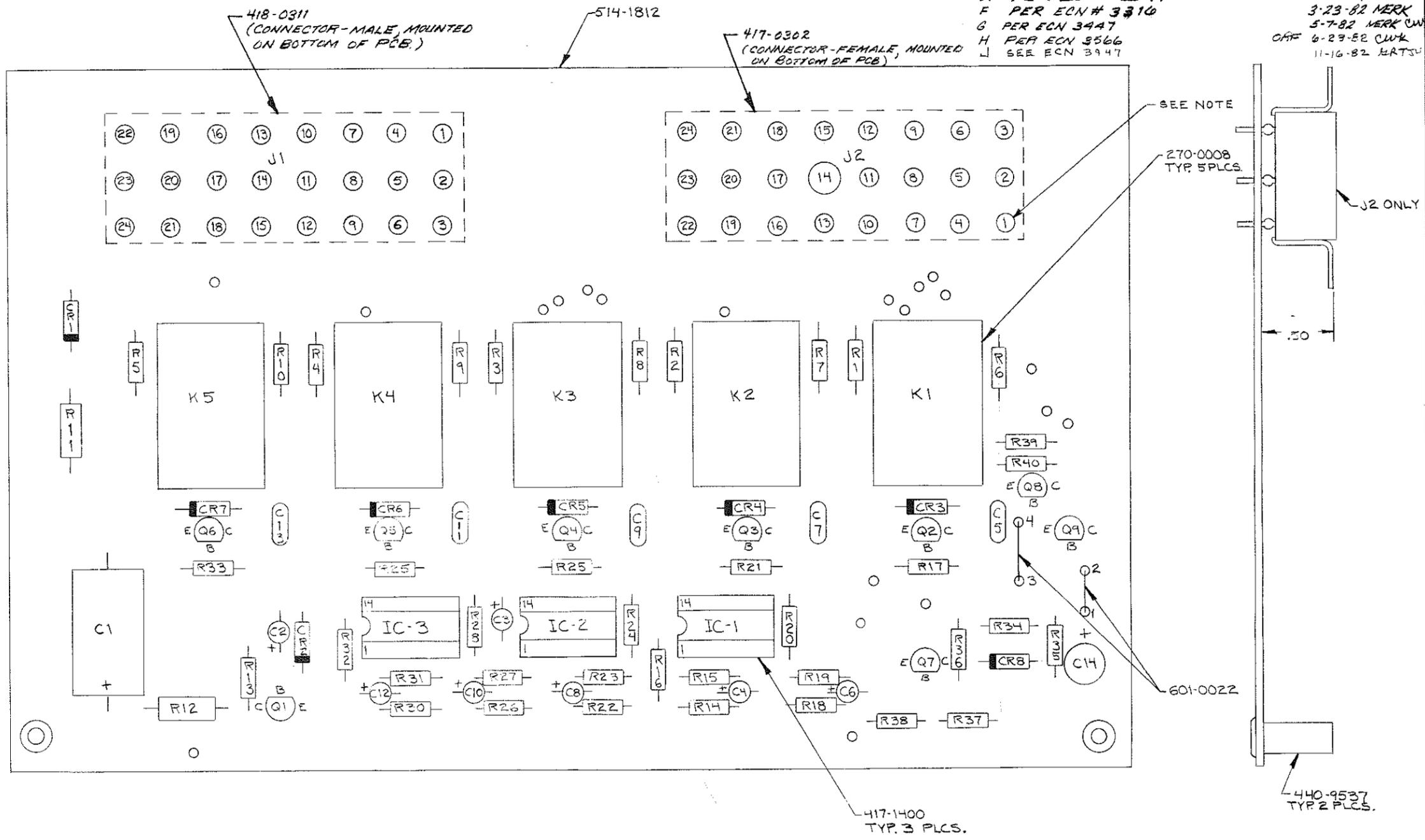
- NOTES:
1. RESISTORS IN OHMS, 1/4W; CAPACITORS IN MICRO-FARADS; DIODES IN4005; TRANSISTORS 2N5816; IC'S 74C00 UNLESS OTHERWISE NOTED.
  2. LAST COMPONENTS USED: R40, C14, CR8, Q9, IC-3, K5 & J2.
  3. J1 IS AUDIO INPUTS & POWER SUPPLY. J2 IS AUDIO OUTPUT & CONTROL.
  4. \* K4 & K5 NOT SUPPLIED IN 3-DECK VERSION.
  5. MODEL # 904-5000 - AUDIO SWITCHER FOR 3-DECK MACHINE  
 MODEL # 904-5001 - AUDIO SWITCHER FOR 5-DECK MACHINE



SEE P C ASSY DWG # D-914-1822

TOLERANCE UNLESS OTHERWISE SPECIFIED		DECIMAL 2 PL-01 3 PL-005	DATE 2/5/76	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
FRACTIONAL 1/164		ANGULARS 1/164	DATE 2-1-76	
SHARP EDGES TO		APPROVED BY		TITLE SCHEMATIC
BEND RADI		PROJECT ENGR		DWG NO. 906-5114
FILLET RADI		MATERIAL		REV C
TREATMENT OR FINISH		SCALE		SWS-E/F
ALL RIGHTS RESERVED		SHEET 1 OF 1		

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PER ECN # 829	6-21-76	LB
B	PER ECN # 856	8-23-76	MSD
C	PER ECN # 1096	1-16-78	CLO
D	PER ECN # 1135	2-3-78	CLO
E	PER ECN # 2577	3-2-81	MM
F	PER ECN # 3310	3-23-82	MERK
G	PER ECN 3447	5-7-82	MERK CWK
H	PER ECN 3566	6-23-82	CWK
J	SEE ECN 3947	11-16-82	KRTSU

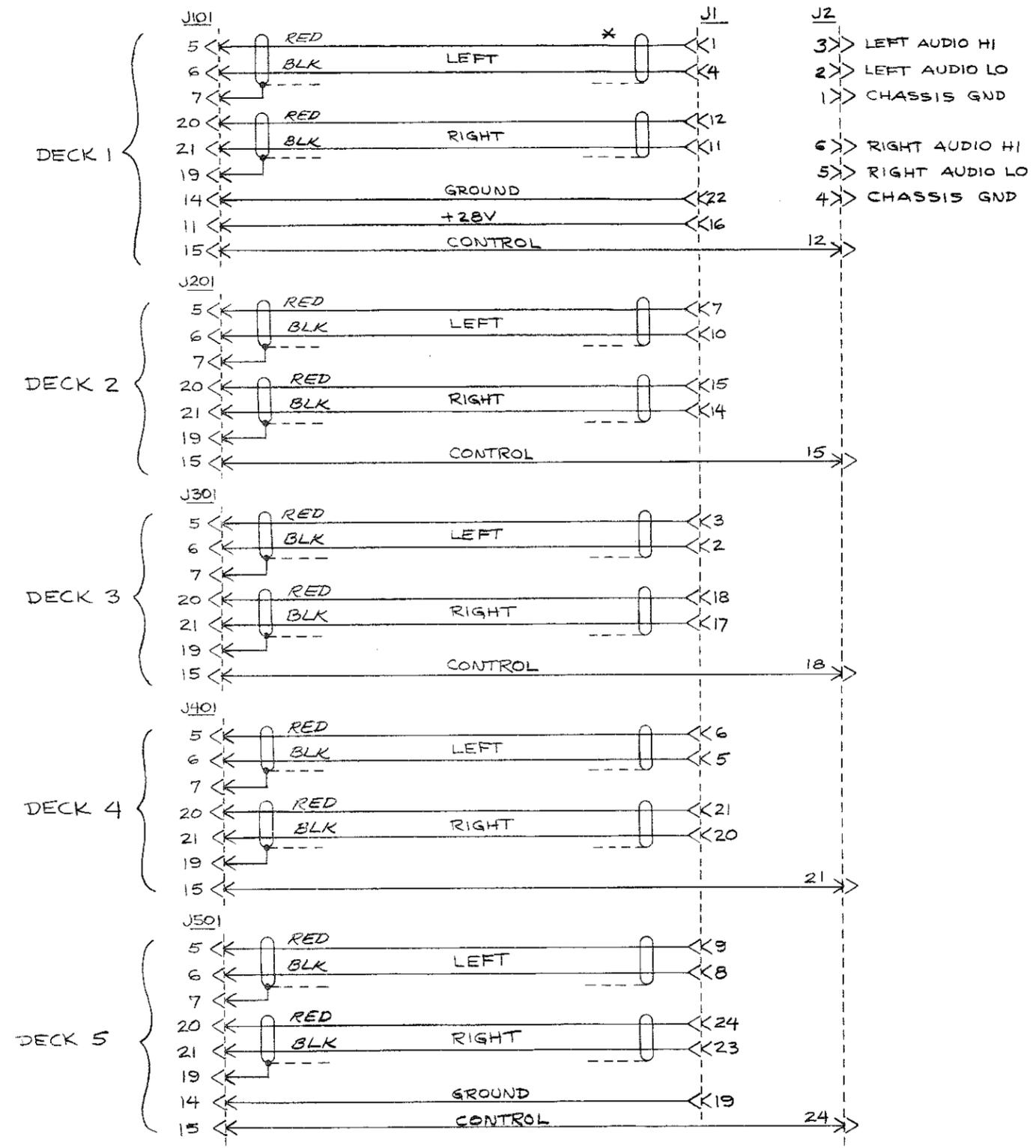


NOTE:  
MATCH PIN #1 ON CONNECTOR WITH #1 ON PCB. - 2 PLCS.

SEE SCHEMATIC D 906-5114  
SEE B/M 914-1822

<b>PROPRIETARY RIGHTS</b> are included in information disclosed herein. This information is submitted in confidence and neither this document nor the information disclosed herein shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by BROADCAST ELECTRONICS, INC.	TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL = .01 3 PL = .005 FRACTIONAL ± 1/64 ANGULAR ± 1° SHARP EDGES BEND RADIUS FILLET RADIUS	DRAWN BY JAH CHECKED BY L. BLUM PROJECT ENGR. APPROVED BY	DATE 2-4-82 DATE 4-1-76	<b>BROADCAST ELECTRONICS INC.</b> —A FILMWAYS COMPANY— TITLE ASSEMBLY-PCB AUDIO SWITCHER	DWG. NO. 914-1822 SCALE 2/1 SHEET 1 OF 1	
	MATERIAL	TREATMENT OR FINISH	DWG. NO. 914-1822 SCALE 2/1 SHEET 1 OF 1			

REVISIONS		DATE	APPROVED
REV	DESCRIPTION		
A	PER ECN # 3266	2/5/82	MERK SJ



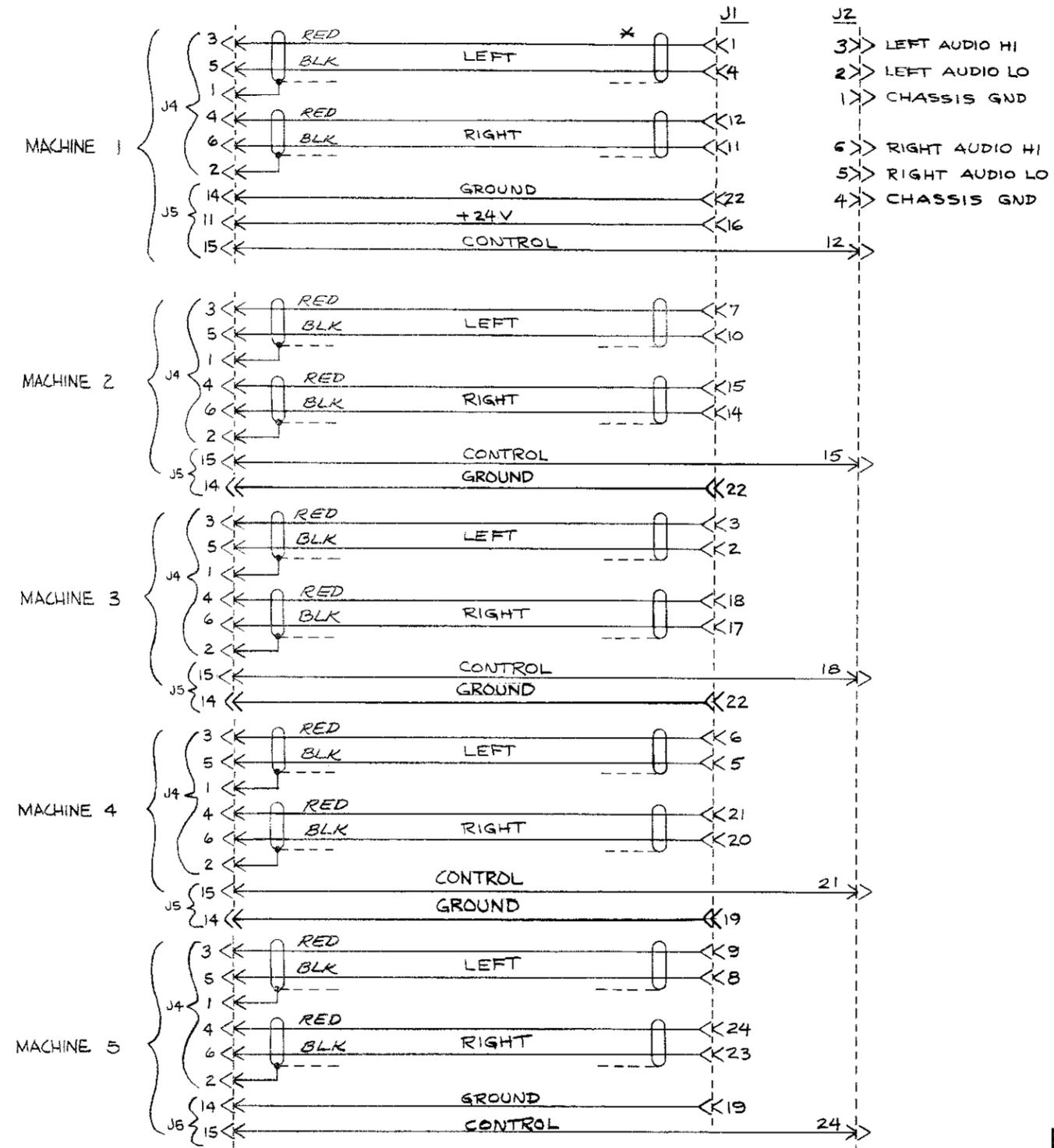
NOTES:

- FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
- \* CABLES TO BE BELDEN 8451 OR EQUIVALENT.
- J1 & J2 ARE ON SWITCHER CARD; J101 THRU J501 ARE ON REAR OF 5-DECK UNIT.
- TO PARALLEL MORE THAN ONE MACHINE:
  - CONNECT SWITCHER OUTPUTS TOGETHER
  - CONNECT A WIRE BETWEEN J2-7 OF EACH SWITCHER.
  - CONNECT A WIRE BETWEEN J1-22 OF EACH SWITCHER.
- POWER MUST BE MAINTAINED ON EACH MACHINE TIED TOGETHER FOR PROPER OPERATION.
- SEE B/M # 304-5001

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PERSONNEL AND CUSTOMERS  
ALL RIGHTS RESERVED

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY MSD	DATE 3/3/76	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
DECIMAL 2 PL = .01 3 PL = .005		CHECKED BY L. BLUM	DATE 4-1-76	
FRACTIONAL ± 1/64		PROJECT ENGR	DATE	TITLE CABLE CONNECTIONS
ANGULAR ± 1°		APPROVED BY		5 DECK STEREO SWITCHER
SHARP EDGES TO				DWG NO. 906-5121
BEND RADIUS				REV A
FILLET RADII				CABLE CONNECTIONS SCALE
MATERIAL		TREATMENT OR FINISH		FOR 5500B - SHEET 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

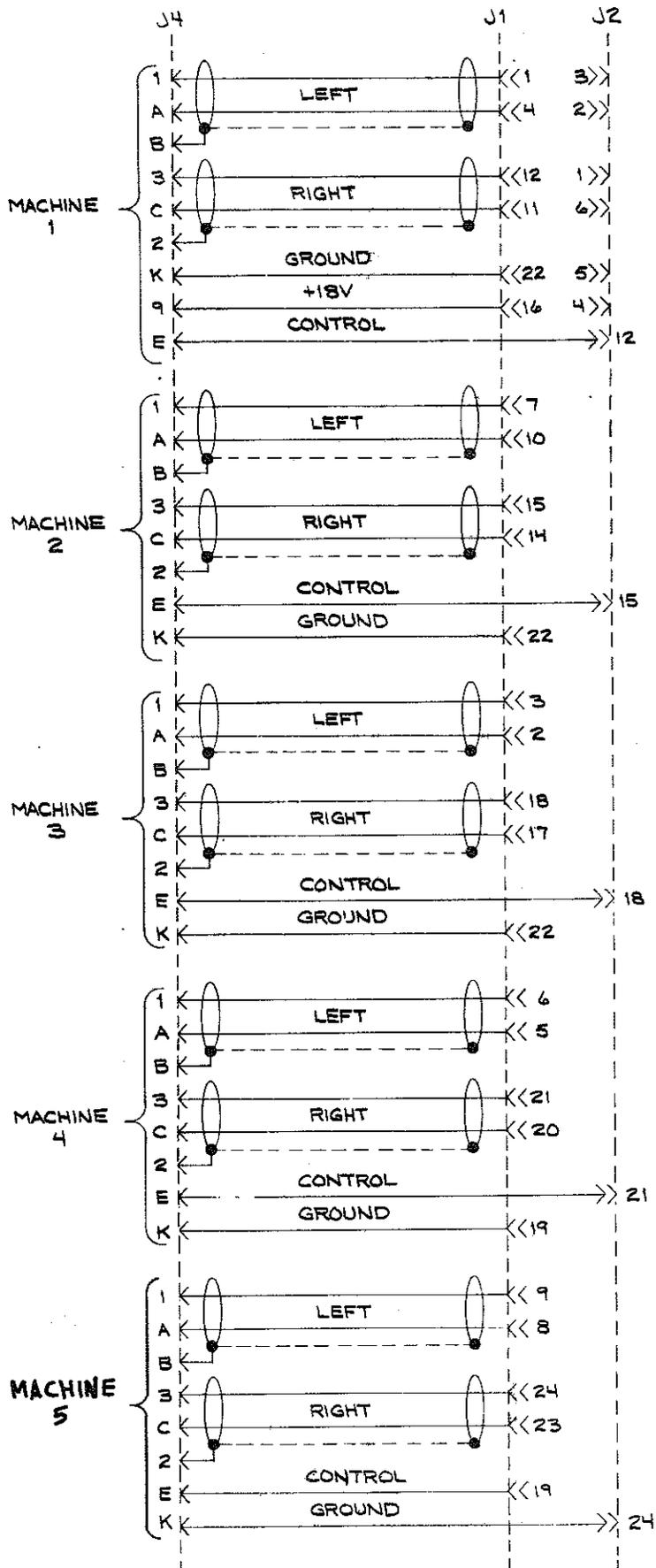


NOTES :

- FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
- \* CABLES TO BE BELDEN 8451 OR EQUIVALENT.
- J1 & J2 ARE ON SWITCHER CARD; J4 AND J5 ARE ON REAR OF 3000 UNIT.
- TO PARALLEL MORE THAN ONE MACHINE:
  - CONNECT SWITCHER OUTPUTS TOGETHER
  - CONNECT A WIRE BETWEEN J2-7 OF EACH SWITCHER.
  - CONNECT A WIRE BETWEEN J1-22 OF EACH SWITCHER.
- POWER MUST BE MAINTAINED ON EACH MACHINE FOR PROPER OPERATION.
- MACHINE #1 PROVIDES +24V FOR SWITCHER.

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY DL MATHAN	DATE 5-31-77	<b>BROADCAST ELECTRONICS INC.</b> - A FILMWAYS COMPANY - TITLE <b>CABLE CONNECTIONS</b> <b>3000 SERIES STEREO SWITCHER</b> DWG NO. <b>906-3143</b> SCALE <b>SWS-E</b> SHEET 1 OF 1
DECIMAL 2 PL ± .01 3 PL ± .005		CHECKED BY S.R.K.B.	DATE 5-31-77	
FRACTIONAL ± 1/64		PROJECT ENGR S.R.K.B.	DATE 5-31-77	
ANGULAR ± 1°		APPROVED BY		
SHARP EDGES		TREATMENT OR FINISH		
BEND RADI				
FILLET RADI				

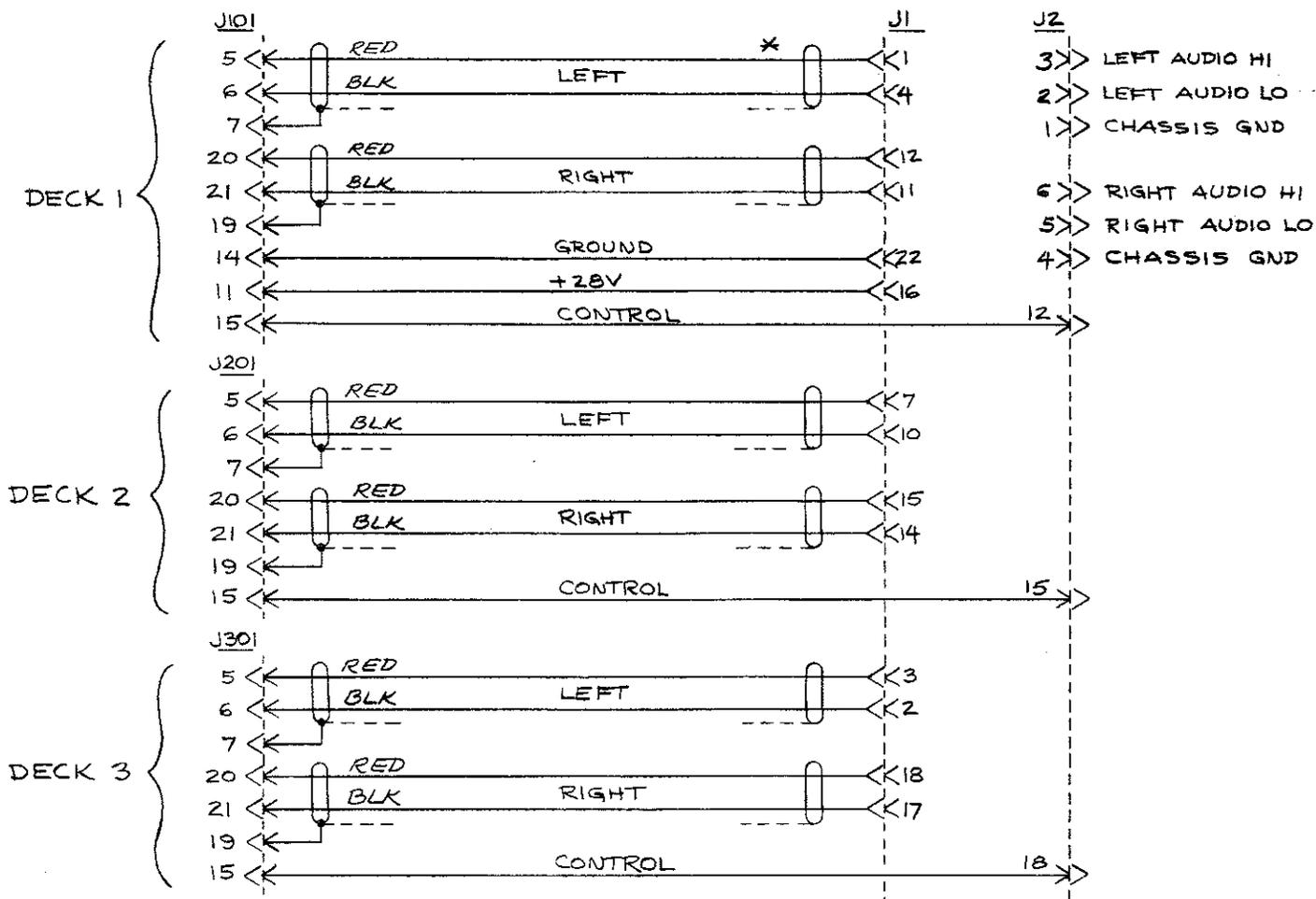
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 PERSONNEL AND CUSTOMERS  
 ALL RIGHTS RESERVED



NOTES:

1. FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
2. CABLES TO BE BELDEN 8451 OR EQUIVALENT.
3. J1 & J2 ARE ON SWITCHER; J4 IS ON REAR OF 2100 UNIT.
4. TO PARALLEL MORE THAN ONE MACHINE:
  - A. CONNECT SWITCHER OUTPUTS TOGETHER.
  - B. CONNECT A WIRE BETWEEN J2-7 OF EACH SWITCHER.
  - C. CONNECT A WIRE BETWEEN J1-22 OF EACH SWITCHER.
5. POWER MUST BE MAINTAINED ON EACH MACHINE FOR PROPER OPERATION.
6. MACHINE No. 1 PROVIDES +18V FOR SWITCHER.

597-5350-4



NOTES :

1. FOR MONO SYSTEMS OMIT RIGHT CHANNEL CABLES.
2. \* CABLES TO BE BELDEN 8451 OR EQUIVALENT.
3. J1 & J2 ARE ON SWITCHER CARD; J101 THRU J301 ARE ON REAR OF 3-DECK UNIT.
4. TO PARALLEL MORE THAN ONE MACHINE:
  - A. CONNECT SWITCHER OUTPUTS TOGETHER
  - B. CONNECT A WIRE BETWEEN J2-7 OF EACH SWITCHER.
  - C. CONNECT A WIRE BETWEEN J1-22 OF EACH SWITCHER.
5. POWER MUST BE MAINTAINED ON EACH MACHINE TIED TOGETHER FOR PROPER OPERATION.
6. SEE B/M # 904-5001

597-5350-25

CABLE CONNECTIONS FOR 5300C AND ALL 5400 SERIES CARTRIDGE MACHINES

## PRODUCT WARRANTY

### LIMITED TWO YEAR

While this warranty gives Purchaser specific legal rights, which terminate two (2) years (one year on turntable, cartridge and blower motors) from the date of shipment, Purchaser may also have other rights which vary state to state.

Broadcast Electronics, Inc. ("Seller") hereby warrants cartridge machines, consoles, and other new Equipment manufactured by Seller against any defects in material or workmanship at the time of delivery thereof, that develop under normal use within a period of two (2) years (one year for turntable, cartridge and blower motors) from the date of shipment, as such term is defined herein. Other manufacturer's and suppliers' Equipment and services, if any, including electronic tubes, solid state devices, transmission line, antennas, towers, related equipment and installation and erection services, shall carry only such manufacturer's or suppliers' standard warranty. This warranty extends to the original user and any subsequent purchaser during the warranty period. Seller's sole responsibility with respect to any equipment or parts not conforming to this warranty is to replace such equipment or parts upon the return thereof F.O.B. Seller's factory or authorized repair depot within the period aforesaid.

In the event of replacement pursuant to the foregoing warranty, only the unexpired portion of the warranty from the time of the original purchase will remain in effect for any such replacement. However, the warranty period will be extended for the length of time that Purchaser is without the services of the Equipment due to its being serviced pursuant to this warranty. The terms of the foregoing warranty shall be null and void if the Equipment has been altered or repaired without specific written authorization of Seller, or if Equipment is operated under environmental conditions or circumstances other than those specifically described in Seller's product literature or instruction manual which accompany the Equipment. Seller shall not be liable for any expense of any nature whatsoever incurred by the original user without prior written consent of Seller.

Seller shall not be liable to Purchaser for any and all incidental or consequential damages for breach of either expressed or implied warranties. However, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to Purchaser. All express and implied warranties shall terminate at the conclusion of the period set forth herein. Any card which is enclosed with the equipment will be used by Seller for survey purposes only.

If the Equipment is described as used, it is sold as is and where is. If the contract covers equipment not owned by Seller at this date, it is sold subject to Seller's acquisition of possession and title.

**EXCEPT AS SET FORTH HEREIN, AND EXCEPT AS TO TITLE, THERE ARE NO WARRANTIES, OR ANY AFFIRMATIONS OF FACT OR PROMISES BY SELLER, WITH REFERENCE TO THE EQUIPMENT, OR TO MERCHANTABILITY, FITNESS FOR A PARTICULAR APPLICATION, SIGNAL COVERAGE, INFRINGEMENT, OR OTHERWISE, WHICH EXTEND BEYOND THE DESCRIPTION OF THE EQUIPMENT ON THE FACE HEREOF.**

**BROADCAST ELECTRONICS, INC.**

4100 North 24th Street, P.O. Box 3606, Quincy, Illinois 62305