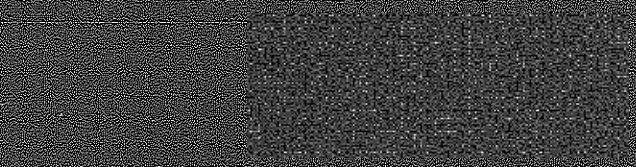
INSTRUCTION MANUAL



SERIES 1000

TAPE CARTRIDGE MACHINES

IM No. 597-1000

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

Replacement and Warranty Parts may be ordered from the address below. Be sure to include equipment model and serial number and part description and part number.

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

PROPRIETARY NOTICE

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.

INSTRUCTION MANUAL

SERIES 1000
TAPE CARTRIDGE MACHINES

TABLE OF CONTENTS

LIST OF DRAWINGS AND ILLUSTRATIONS

1.1 General Description and Features

The SPOTMASTER® 1000 tape cartridge machines are designed to meet or exceed the National Association of Broadcasters' standards for tape cartridge recording and reproduction. The SERIES 1000 machines are capable of performing a variety of studio assignments and still stay within the limits of the most conservative budget.

Standard features include the 1 kHz stop cue tone. The use of balanced transformer output assures quality audio signals with a minimum of interference. Quick response--under 80 milloseconds--Start/Stop times and a noise figure of 54 dB, well above NAB standards, make the SERIES 1000 machines a practical piece of studio equipment.

Table top units accept standard A, B and C size cartridges. The dual rack mounted configuration accepts A and B size only.

1.2 Specifications

Noise: 54 dB below +8 dBm output
Frequency Response: ±2 dB, 50 - 15,000 Hz
Distortion: 2% or less at +16 dBm output
Tape Speed: 7.5 ips accurate 0.2% or better
Optional 3.75 ips accurate 0.4% or better
Wow and Flutter: Less than 0.2% RMS (NAB unweighted)
Output: Peak output +16 dBm, continuously adjustable, 600 ohms, transformer balanced
Start and Stop Time: 80 milliseconds minimum
Equalization: NAB standard
Drive: Hysteresis synchronous, indirect
Power: 117 VAC/60 Hz standard
220 VAC/50 Hz optional
117 VAC/50 Hz optional
Cue Tones: 1 kHz stop standard
Dimensions: 5-5/8" high X 8-1/2" wide X 12" deep

Options

Rack Adaptor: Mounts two SERIES 1000 units side by side in 19" rack

1.3 Warranty

Broadcast Electronics, Inc. products are guaranteed to be free from defects in workmanship and material for a

period of one year from the date shipped when subjected to normal usage and service. All warranties are void, A) If equipment has been altered or repaired without specific prior authorization from Broadcast Electronics, Inc., or B) If equipment is operated under environmental conditions or circumstances other than those specifically described in the appropriate literature or instruction manuals provided with each unit.

1.4 Service

The Customer Service Department is at your service to answer questions involving Broadcast Electronics, Inc. products. Technical assistance is available in your area from the local franchised dealer or you can write or call us direct at (301) 588-4983. Our address is on the cover of this manual.

In the event a unit must be returned to us for repair, please make arrangements in advance by contacting the Customer Service Department or your local dealer for return authorization procedures. Equipment being returned should be sent by common carrier, prepaid, insured and well protected as we can assume no liability for inbound damage making necessary repairs the obligation of the shipper.

2.1 Unpacking

Your new SPOTMASTER® 1000 will be ready to go to work as soon as all protective packing material has been removed. The carrier has assumed all responsibility for the safe delivery of this unit to you; therefore, any claim for damage should be made promptly and directly to him.

NOTE

Before connecting the unit to a power source, be sure the clear plastic ty-rap, used to secure the motor to the bottom panel during shipment, has been removed and discarded. In addition, the fuse provided with each unit (attached to the line cord) should be installed in the rear panel fuse holder.

2.2 Audio Output/Input Connections

The unbalanced phone type connectors J-1 (Output) and J-2 (Input - record models only) are located on the rear panel. The mating connectors may be wired for either balanced or unbalanced operation as shown in the diagrams on pages 17 and 18.

The output level is set at the factory for a nominal 0 dBm level and is designed to be connected to a 600 ohm load. If placed in a higher impedance situation, a termination must be provided in the form of a 560 or 620 ohm resistor across the output to ensure proper frequency response. (See diagrams on pages 17 and 18).

The recorder input channel provides a high impedance for high level (-20 to + 10 dBm) line signals. If a 600 ohm transformer coupled device is connected to the input, a 560 or 620 ohm terminating resistor should be installed, as shown in the diagrams on page 16, to insure proper frequency response.

2.3 Microphone Input

The record input is set at the factory for line level recording. If a microphone is to be used, the following terminals within the record module must be jumped--Pin 11 to Pin 12 and Pin 10 to Pin 13.

3.1 Playback

For Playback, begin by turning on the AC power at the switch located on the rear panel. When the STOP lamp on the front panel is illuminated and the tape drive capstan is rotating and pressure roller is in release position, you are ready to insert a cartridge.

Table top mounted units will accept all three sizes of NAB standard cartridges. Because the C size (1200 Series) extends beyond the left side of the machine, it cannot be used if two units are mounted side-by-side in the dual rack adapter.

TO PLACE THE TAPE IN MOTION, depress the START switch on the front panel. Only momentary pressure is required as you observe the STOP switch lamp extinguish and the START switch lamp illuminate.

3.2 Record

To Record, begin by depressing the red REC switch. The lamp in this switch will illuminate indicating the unit is in the recording mode. Changing to the recording mode can be accomplished only after the unit has been taken out of the playback or run mode by depressing the STOP switch.

Before starting the cartridge, preset the record level by playing the material to be recorded or speaking into the microphone. Adjust the front panel LEVEL control so that the VU meter, which is active only in the record mode, indicates a maximum 0 VU (100) on peaks.

When the level is set, re-cue the material to be recorded. Start the SERIES 1000 unit by depressing the START switch. Then start the material to be recorded, allowing a 1/4 to 1/2 second lag between the start of the cartridge and the start of the program material.

The unit will stop automatically when the cartridge reaches the end of its tape, or you can manually halt the recording at any point by depressing the STOP switch. (In either case, the unit will return to the playback mode whenever it is stopped.)

NOTE

In the record mode, the 1 kHz stop tone is placed on the tape whenever the START switch is depressed.

4.1 Routine Cleaning and Adjustments

As you already know from experience, any good piece of equipment will last longer and run better if it is given regular maintenance attention. Your SPOTMASTER® SERIES 1000 tape cartridge machine is no different.

Tape heads and pressure rollers should be cleaned daily using the appropriate head cleaner solution. Traces of lubricant and oxide can be removed from the capstan and pressure rollers with a cloth that has been dipped in alcohol.

Tape heads should be demagnetized and alignment adjusted (see paragraph 4.2) periodically depending on machine use.

4.2 Head Alignment

The alignment of a new head or the realignment of the present head requires two adjustments: tracking height and azimuth. Check the tracking height of the reproduce head first and then the record head. All adjustments will be made first on the reproduce head.

When adjusting the tracking height and azimuth, final turns should be made on the adjusting screws in a CLOCKWISE direction so that the spring under the mounting block is being compressed. A .050 Allen wrench is provided with each unit for these adjustments.

To check the tracking height of the reproduce head, remove the pressure pads from the cartridge so the tape can be observed as it passes the head. The top can be left off the cartridge if the hold-down wire is glued in place, or a section may be cut out of the top in the area of the pressure pads.

With the tracking cartridge in the machine and the tape in motion, observe the path the tape travels across the head. Adjust the tracking height screw until the top edge of the tape just covers the top of the head pole piece and the bottom edge of the tape is in a similar position in reference to the bottom pole piece.

Remove and re-insert the tracking test cartridge and start and stop the tape motion several times. If the tape does not repeat each time, check the tape guides on the head mounting bracket. The guides should be down square against the deck surface.

When tracking height is adjusted, remove the tracking test cartridge and insert a 15 kHz azimuth test tape.

Set the tape in motion and observe the output level on a VU meter. Adjust the reproduce head azimuth adjustment screw for maximum output.

Note that when aligning a newly installed head, it may not be possible to get correct azimuth readings if the brass collar has been tightened too much. This will compress the washer so much that the head and clamping block cannot move.

When the azimuth adjustments are complete, reinsert the tracking cartridge to confirm the tracking height adjustment. If the adjustment has changed, continue to reference the two test cartridges against each other to establish correct head placement.

When the reproduce head adjustments are complete, proceed to adjust the tracking height of the record head. The azimuth of the record head is determined by recording a 12 KHz tone and adjusting the record head for maximum output at the reproduce head.

With the tracking height of the record head set, insert an erased cartridge and put the tape in motion in the record mode. Feed a 12 Hz tone to the record input and adjust the line level control for a program level indication of -10 VU on the front panel VU meter.

Adjust the azimuth adjustment screw for the record head to maximum output using an external VU meter. When the azimuth is set, recheck the height with the tracking cartridge. If the adjustment has changed, continue to reference the two test cartridges against each other to establish correct head placement.

Improper tracking height will reduce separation between the cue and program tracks causing an increase in cross-talk. Improper azimuth will cause high frequency response to decrease.

4.3 Deck Adjustments

Refer to drawing number D-906-2109

4.3.1 Roller Perpendicularity

Manually raise the pressure roller by pushing the push link assembly screw. Apply a slight back pressure to the pressure roller. With a square, Broadcast Electronics' gage block (stock number 836-0004), or by eye, determine if the pressure roller is parallel to the plane of the tape capstan.

If the roller is not parallel to the capstan, remove the two flat head screws on the extreme right and left

in front and the two pan head screws in the rear which secure the tape deck to the chassis. DO NOT REMOVE THE TWO CENTER SCREWS IN FRONT. Raise the tape deck to gain access to the pressure roller latch on the underside of the deck. Loosen the two screws which mount the latch and move it as required toward the front or back of the deck until the roller is parallel to the capstan. Retighten the latch mounting screws when finished.

4.3.2 Push Link Assembly Screw

Check the adjustment of the push link assembly screw by slowly inserting a cartridge in the deck and noting when the pressure roller latch engages. The latch should engage just as the cartridge comes in contact with the cartridge stop.

If the cartridge latches before it comes in contact with the stop, adjust the push link screw CLOCKWISE. If the latch is not engaged with the cartridge against the stop, adjust the push link screw COUNTER-CLOCKWISE.

If the tape creeps when the right hand corner cartridge is pushed, turn the push link screw 1/4" CLOCKWISE. If the tape still creeps, check for excessive gap between the solenoid armature assembly and the solenoid. The gap should be no more than the thickness of a dime.

Optimum adjustment of the push link assembly screw will differ depending on the cartridge manufacturer. If different makes of cartridges are intermixed, each type should be tested and an acceptable compromise setting established.

4.3.3 Pressure Adjustment

Using a 5-1/2 to 10-minute cartridge, start the unit. Insert a 7/64" Allen wrench (stock number 836-0003) through the access opening in the front panel just below the release button and turn COUNTER-CLOCKWISE until the tape stops moving. Now turn the adjustment 3/4" CLOCKWISE or until the tape runs smoothly.

When a flutter meter is available, the pressure should be adjusted for minimum pressure and flutter output when reproducing a standard flutter test tape.

4.4 Tape Drive System Servicing

Refer to drawing number C-906-2105

Remove the screws which secure the deck plate to the chassis (see second paragraph 4.3.1). Raise the deck plate and unplug the motor from the power supply.

NOTE

Release the motor plug locking device before removing the plug.

In the record equipped units, also unplug the record head leads from the phono jacks underneath the deck plate.

With the deck plate on the workbench, remove the sub-assembly and dismount the motor from its mounting plate. Set the motor and mounting hardware aside. To remove the drive pulley from the motor shaft, loosen the set screw. Grasp the top of the motor in the left hand and the rotor in the right. Firmly but gently pull the rotor and shaft out of the stator.

Using a soft, lint-free cloth, clean the motor shaft with a household cleanser (Comet, Bon Ami, etc.) and warm water. Rinse and dry the shaft. Avoid getting water on the rotor. Re-oil the shaft with light-weight, non-detergent oil (stock number 832-0010). Wipe off excess oil with a soft, lint-free cloth.

Re-insert the rotor in the stator. Carefully fit--don't force--the shaft straight through the bottom bearing. Line up the plastic dust cap with the end of the shaft and firmly push the shaft through the cap. If this cap pops loose, simply press it and the corresponding metal cap back into place. By hand, check the rotor for free rotation.

Reinstall the pulley on the motor shaft with the large diameter towards the motor. Position the pulley approximately 3/8" away from the motor and set the motor aside for the moment.

NOTE

Belts must run level when the deck is in operating position.

Clean and lubricate the bearing surface in the motor shield and set it aside.

Remove the shaft retaining plate. With a soft, lint-free cloth, wipe off the thrust bushing and flywheel bearing. Re-lubricate the thrust bushing with Lubriplate or Vaseline. With isopropyl alcohol, clean any dirt from the belt grooves on the flywheel. Remount the shaft retaining plate.

Fit the drive belts on the flywheel and the pulley. Remount the motor with the motor leads oriented as shown on drawing number C-906-2105. The long screws and bushings are used to mount the motor.

Visually check the alignment of the drive belts and pulley with the flywheel. Be sure the belts do not rub on the motor leads.

Remount the sub-assembly on the deck plate. Reconnect the motor plug (and head leads in record units). Remount the deck plate in the chassis.

When AC power is applied to the unit, the drive system should operate smoothly and quietly.

5.1 General Considerations

Before adjusting the electronics, clean the tape head(s) with BE-903 cleaning fluid or isopropyl alcohol. Be sure the reproduce (and record) head(s) are properly aligned.

An NAB standardized test and alignment cartridge is required for proper adjustment of the unit. Two different styles are available from Broadcast Electronics: stock numbers 808-0003 (NAB type 3), monophonic, and 808-0004 (Fidelipac 350 STA), stereophonic. The Fidelipac is particularly recommended for users of stereophonic cartridge machines.

The tones recorded on these test and alignment cartridges are at two levels: NAB standard operating level and 10 dB below NAB level. The operating level segment is required for adjusting output level and in measuring noise and distortion. Frequency response measurements and equalization adjustments are made with the other tones.

5.2 Output Level

Refer to Drawing Number C-914-1390

While reproducing the NAB operating level tone from the test cartridge, adjust R14 on the playback board for the desired output as measured on an external VU meter connected to the output.

5.3 Playback Equalization

Refer to Drawing Number C-914-1394

While reproducing the 50 Hz tone from the test cartridge, adjust R9 on the playback board for -10 VU (10 dB below the output level setting) as measured on an external VU meter connected to the output. Reproduce the 15 kHz test tone and adjust R10 on the playback board for -10 VU on the external VU meter.

5.4 Cue Tone Sensor Level

Refer to Drawing Number C-914-1390

The cue tone sensor is adjusted while reproducing a cue tone test cartridge. During the 1 kHz stop tone, adjust R24 so that the sensor just triggers and stops the unit.

Each time the test cartridge is started, wait 3 seconds before adjusting the stop sensor. The sensor circuitry is disabled for this time.

If a cue tone cartridge is not available, tones from an audio signal generator may be used to adjust the sensor. To do this, begin by disconnecting the AC power and then the blue head leads from the playback board. Connect the signal generator to Pin 3 (ground) and Pin 4 (signal) of the playback board. Do not load a cartridge in the unit but manually raise the pressure roller and operate the controls. Set the generator for 1 kHz with a level of .45 mV and adjust R24.

When the adjustments are complete, disconnect the AC power and reconnect the head leads.

5.5 Program Record Adjustments

Note that the following adjustments are required only in units equipped with the record module. Remove the cover to gain access to the record board. If necessary, adjustments may be performed with the module outside the unit. Always be sure the power is off before removing or inserting modules.

5.5.1 Bias Trap Tuning

Refer to Drawing Number C-914-1393

Connect a high frequency, AC VTVM between the junction of R26 - C15 to ground. Depress the REC switch to place the unit in record. Do not supply any signal to the input. It is not necessary to load a cartridge in the machine. With a non-metallic screwdriver, such as a G.C. Electronics alignment tool, tune L1 for a minimum reading on the VTVM.

5.5.2 Program Bias Level

The bias supplied to the record head is most important in providing optimum frequency response. Bias requirements vary between brands of tape and between series of one brand. If more than one type of tape is in use, check the performance of each type at its optimum bias level against the performance at the optimum bias level for other tapes. Where older and newer tapes are both in use (such as 3M154 and 156), bias just less than the optimum for the newer type usually is an acceptable compromise.

Once the bias trap is tuned, load a bulk-erased cartridge in the unit. Connect an audio signal generator to the rear panel record input. Set the generator for 400 Hz at a level of 0.5 V. Adjust the record level control for -10 VU on the front panel meter. Connect an external VU meter to the OUTPUT. Begin recording. Observe the ex-

ternal meter and adjust R70 on the record module for the peak output.

5.6 VU Meter Calibration

While recording the 400 Hz tone, adjust the record level control until the external meter indicates the output level determined in paragraph 5.2. Now adjust R30 on the record module so that the front panel VU meter indicates 0 VU.

5.7 Record Equalization

Now set the signal generator for 15 kHz. Adjust the generator output for 10 dB below level in the meter calibration step. DO NOT ADJUST THE FRONT PANEL LEVEL CONTROL. While recording the 15 kHz tone, adjust R20 on the record module for -10 VU on the external VU meter (10 dB below the output level established in paragraph 5.2).

6.1 Cue Bias Level

Refer to Drawing Number C-914-1393

Connect a high frequency, high impedance VTVM to terminals 1 and 2 of the record module (the cue record head leads). Depress the REC switch to place the unit in record. Do not load a cartridge in the unit, but depress the START switch. After 3 seconds, adjust R63 on the record module for 5 VRMS as measured on the VTVM.

6.2 Cue Tone Record Levels

Referring to drawing number C-914-1390, connect a VTVM to terminals 3 and 4 of the playback board. Load a bulk-erased cartridge in the deck and depress the REC switch. DO NOT DEPRESS THE START SWITCH. Instead, manually put the tape in motion by pressing the play solenoid armature against the play solenoid by hand. While thus recording a continuous stop tone, adjust R60 on the record module for 0.45 mV on the VTVM.

Release the solenoid and depress the START switch. After 3 seconds, depress the Q1 switch to record continuously the 150 Hz auxiliary cue tone. Adjust R59 on the RECORD module for 0.3 mV on the VTVM.

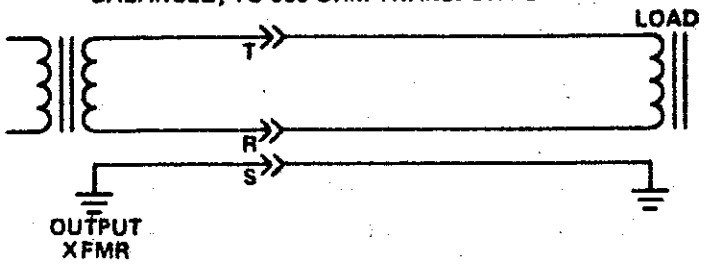
BALANCED USING ¼" STEREO PHONE PLUG (SWITCHCRAFT 267 OR EQUIVALENT)

UNBALANCED USING ¼" STEREO PHONE PLUG (SWITCHCRAFT 267 OR EQUIVALENT)

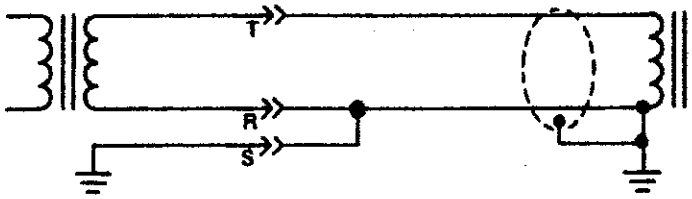
UNBALANCED USING STANDARD ¼" 2 CONDUCTOR PHONE PLUG

SCHEMATIC CONNECTIONS

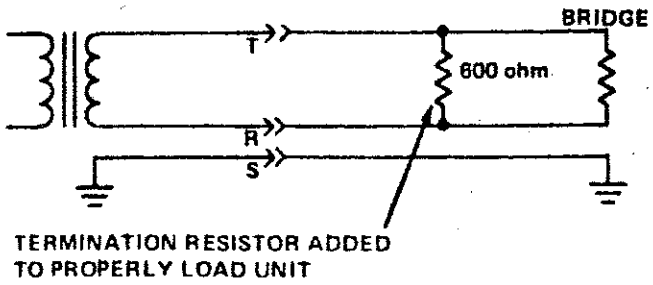
BALANCED, TO 600 OHM TRANSFORMER



UNBALANCED, TO 600 OHM TRANSFORMER

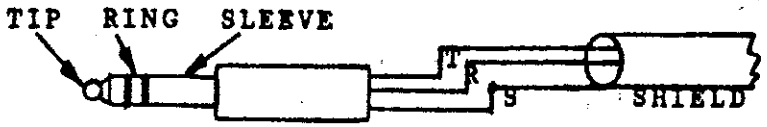


BALANCED, TO HIGH IMPEDANCE BRIDGE



Typical Output Connections

BALANCED USING ¼" STEREO PHONE PLUG (SWITCHCRAFT 267 OR EQUIVALENT)



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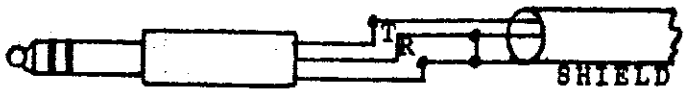
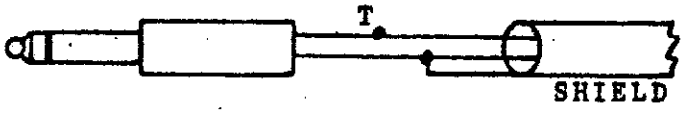
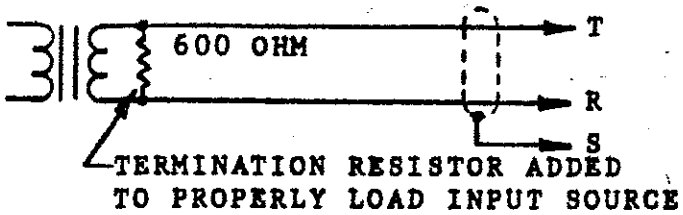


UNBALANCED USING STANDARD ¼" 2 CONDUCTOR PHONE PLUG

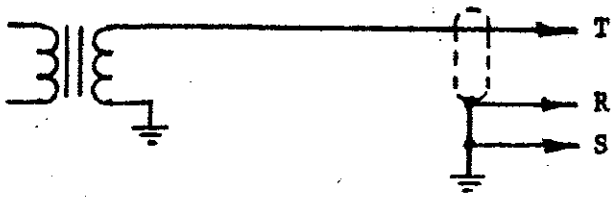


SCHEMATIC CONNECTIONS

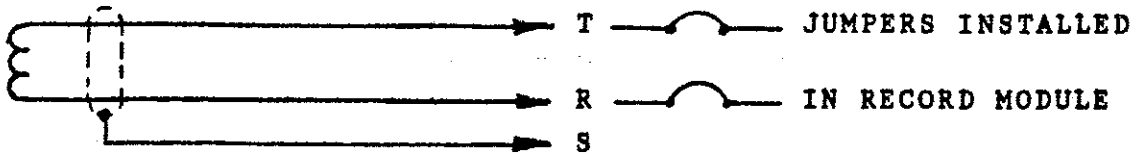
BALANCED LINE FROM 600 OHM TRANSFORMER



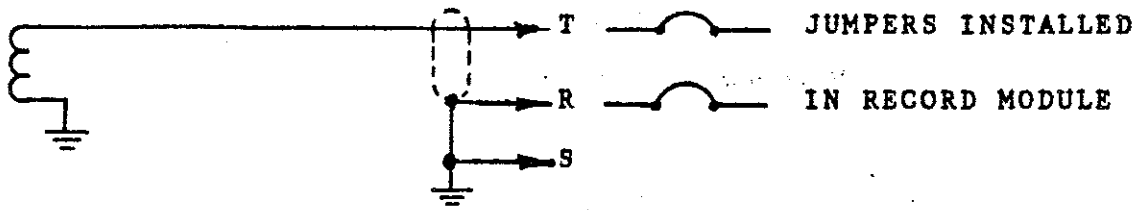
UNBALANCED LINE FROM 600 OHM TRANSFORMER



BALANCED MICROPHONE



UNBALANCED MICROPHONE



TYPICAL INPUT CONNECTIONS

PLAYBACK SECTION

DM1B DUAL TRACK PLAYBACK HEAD

PGM

PRE AMP

OUTPUT LEVEL

DRIVER AMP

AUDIO OUTPUT

HF

LF

EQUALIZER

CUE SENSORS

CUE

PRE AMP

EQUALIZER

BOOSTER AMP

STOP CUE MUTE

1KHz SENS

1KHz

STOP SET

+20 V PULSE W/TONE

(GND TO MUTE)

DELAY

START

RUN SET

GND IN RUN

RUN FLIP FLOP

GND IN STOP

STOP

RECORD INTERLOCK

RECORD SECTION

INPUT

INPUT SENS SELECT

PRE-AMP

REC LEVEL

BOOSTER AMP

EQUAL-IZER

DRIVER

BIAS TRAP

DM2RB DUAL TRACK RECORD HEAD

PGM

HF

PGM REC ENABLE

VU CAL

DRIVER

VU

PGM BIAS ADJ

PGM BIAS

RECORD CANCEL

GND IN RUN

REC SET

RECORD FLIP FLOP

GND IN REC

BIAS CUE CONT

+24VDC IN REC

RECORD

CUE REC ENABLE

BIAS OSC CONT

BIAS OSC

CUE BIAS ADJ

CUE BIAS

1KHz REC CONT

DELAY

1KHz

LEVEL ADJ

BIAS TRAP

CUE

CUE TONE GENERATORS

DRIVE SYSTEM & POWER SUPPLY

AC INPUT

FUSE

PWR SW

LOW VOLTAGE POWER SUPPLY

+24 VDC

+30 VDC

PLAY SOLENOID

MOT

NOTES:

■ - CONNECTIONS TO +24 VDC

2. RECORD PROVIDED ONLY IN 1000 RP

BLOCK DIAGRAM - SERIES 1000

REV A - ECN 467 4/24/75

1KHz REC ENABLE (GND IN STOP)
PL-14
CR5
CR6
CR4
R48 10K
C23 33
R51 62K 5%
R49 10K
R50 10K
C24 .047
C25 .047
C26 .047
R52 330Ω
R53 15K
IC-3A
1KHz (STOP) GENERATOR
R71 820K
C31 1.0
R60 20K .1W 20%
1KHz LEVEL ADJ
R61 10K
C32 220 pf
CUE BIAS TRAP
L2 10 MHY
C33 240 pf
BIAS OSCILLATOR
T1
Q9 2N3053
Q10 2N3053
R64 27Ω
R65 27Ω
R66 1K
R67 1K
C37 .01
C35 .0047
C36 .0047
C38 .02
R68 22K
R69 22K
C34 500pf
CUE BIAS ADJ
R63 100K .1W 20%
BLU
YEL
CUE
+24V IN RECORD MODE
PANEL
REC SW
S1
REC
SET
R39 22Ω
R33 4.7K
R32 47K
R34 4.7K
C21 33
RECORD INTERLOCK
PL-8
CR2
CR3
RECORD CANCEL
PL-15
+24V
PS-2
R46 47K
R45 47K
Q3 2N5817
R38 10K
CR1
R11 4.7K
R35 4.7K
R36 4.7K
C20 100
Q6 2N 3053
R37 4.7K
R42 3.9K
R40 22K
R41 22K
R43 3.9K
Q4 MPS 6566
Q5 MPS 6566
C22 .01
R44 39K
RECORD FLIP FLOP
R12 100K
R23 2.2K
R28 100K
R29 10K
R31 220K
IC-2A
VU METER AMP
R30 10K .1W 20%
C17 4.7
VU METER CAL
C18 4.7
R27 2.7K
C19 500 pf
PANEL
VU
PGM BIAS ADJ
R70 100K .1W 20%
PGM BIAS TRAP ADJ L1
8-20 MHY
C16 150 pf
ORN
RED
PGM
C13 4.7
R26 2.7K
Q2 MPS 6566
R25 10K
R21 270K
R22 22K
C14 .01
C15 220 pf
R24 1K
R16 56K
C12 4.7
R13 100K
R14 1K
R15 47K
C8 4.7
C10 .003
HF ADJ R20 100K .1W 20%
R17 39K
C11 1.0
R18 4.7K
R19 4.7K
IC-2B
C7 4.7
R10 10K
C9 33
Q1 2N 5462
PANEL RECORD LEVEL
R73 10K
JUMPERS INSTALLED FOR MIC INPUT
RECORD INPUT
J2
R2 56K
R1 56K
R4 470Ω
R3 470Ω
C2 100
C1 100
R6 100Ω
R5 100Ω
C4 220 pf
R9 1.5K
R8 100K
C6 4.7
C5 22 pf
IC-1
RECORD PREAMP
R7 100K
GND LUG

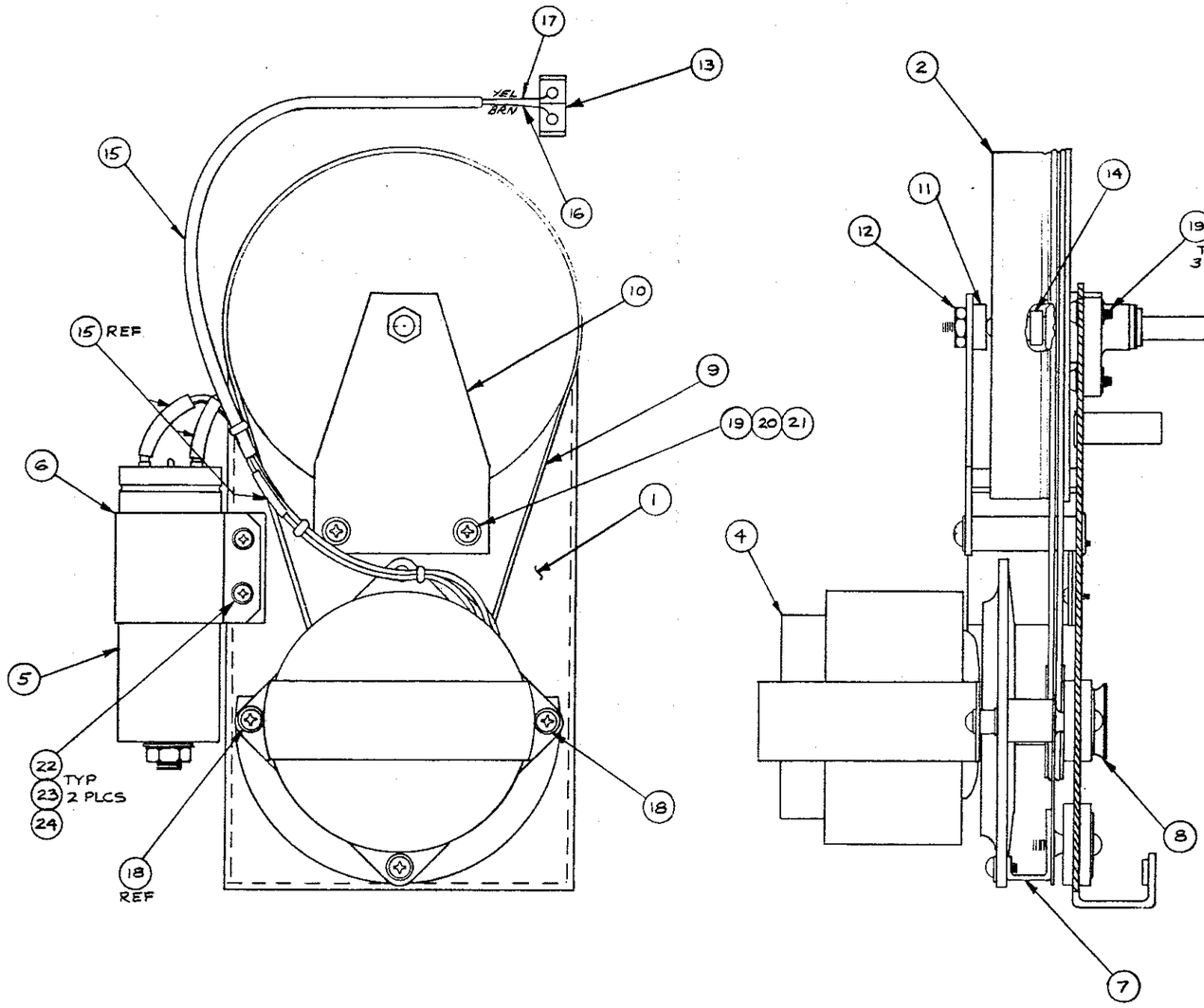
NOTES:
1. RESISTORS IN OHMS, 1/4W, 10%; CAPACITORS IN MICROFARADS; DIODES IN457; UNLESS NOTED OTHERWISE.

BROADCAST ELECTRONICS, INC.
- A FILMWAYS COMPANY -

1000 SERIES
RECORD MODULE SCHEMATIC
C-906-1101 REV A

DRAWN: 12/24/74 W.L.J.
CHECKED:

REV A 04/09/75 ECN 463 WM.



NOTES:

1. REMOVE SHAFT FROM FLYWHEEL ASSY (ITEM 2) & REPLACE WITH SHAFT (ITEM 3).

ITEM	PART NUMBER	QTY	DESCRIPTION
24	——	2	FLAT WASHER, #4
23	——	2	LOCK WASHER, INT TEETH #4
22	——	2	PHMS, PHIL #4-40 X 1/4"
21	——	2	FLAT WASHER, #6
20	——	5	LOCK WASHER, INT TEETH #6
19	——	5	PHMS, PHIL #6-32 X 3/8"
18	——	2	PHMS, PHIL #6-32 X 1/2"
17	601-2209	14"	WIRE, AWG 22, YEL
16	601-2201	12"	WIRE, AWG 22, BRN
15		12"	TUBING
14	A407-0032	1	SPACER, FLYWHEEL
13	695-0701V	1	2-PIN PLUG
12	——	1	NUT, HEX, NYLON, #10-32
11	A-420-0074	1	THRUST BUSHING
10	A-474-0073	1	SHAFT RETAINING PLATE
9	405-0438	2	"O" RING BELT
8	389-0100	1	MOTOR PULLEY
7	389-9156	1	MOTOR MOUNTING KIT
6	453-0006	1	CAPACITOR HOLDER
5	029-6064	1	CAPACITOR
4	A-384-1052	1	MOTOR
3	B-444-4152	1	FLYWHEEL SHAFT
2	444-0335	1	FLYWHEEL ASSEMBLY
1	C-530-0003	1	MOTOR MOUNTING SUPPORT PLATE
X	C-906-2105	X	MOTOR MOUNTING SUB ASSY

PARTS LIST

BROADCAST ELECTRONICS, INC.
- A FILMWAYS COMPANY -

1000/2000 SERIES

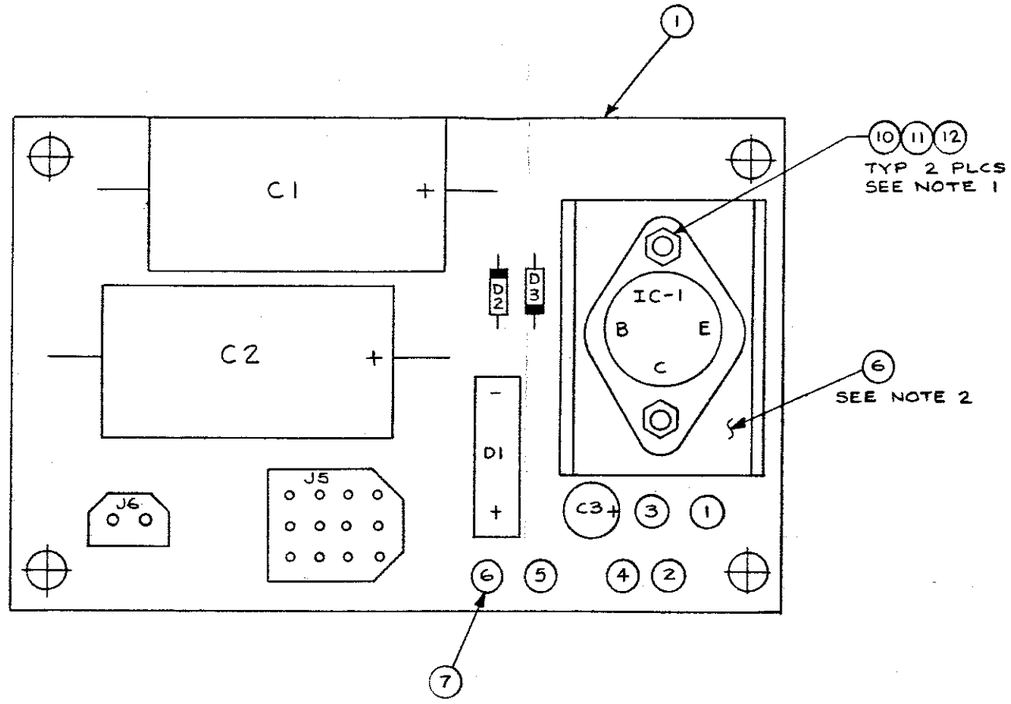
MOTOR MOUNTING SUB ASSEMBLY

C-906-2105 REV A

DRAWN: 12/13/74 WMSB
CHECKED:

SCALE: FULL

REV B ECN # 444 REVISED & REDRAWN 3-10-75



NOTES:

1. REGULATOR TO BE MOUNTED WITH SCREWS FROM BOTTOM OF BOARD.
2. HEAT SINK TO BE PROPERLY ORIENTED WITH REGULATOR PINS.

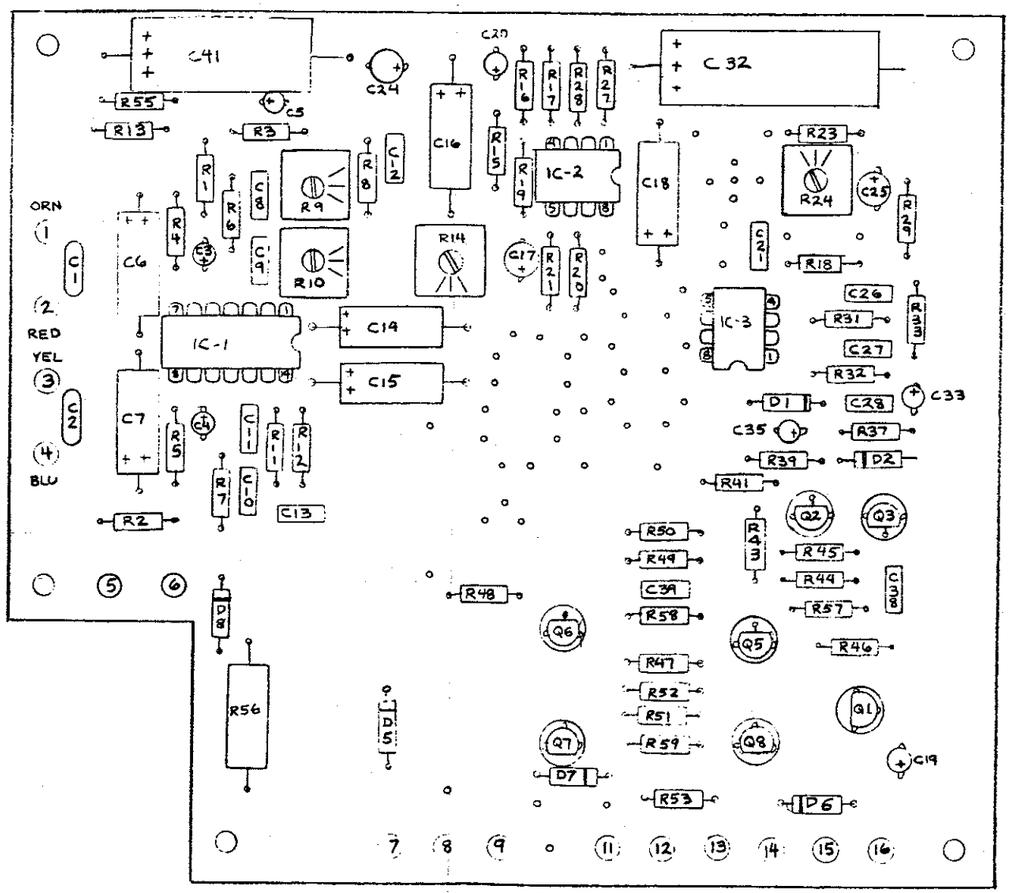
ITEM	PART NUMBER	QTY	DESCRIPTION
13	239-0003	1	BRIDGE RECTIFIER (D1)
12	———	2	HEX NUT, #6-32
11	———	2	L/WASHER, #6, INT TEETH
10	———	2	PHMS, PHIL, #6-32 X 3/8
9	695-0700	1	2-PIN CONNECTOR AMP (J6)
8	695-1276	1	12-PIN CONNECTOR AMP (J5)
7	413-1597	6	TURRET TERMINAL
6	455-6103	1	HEATSINK
5	064-3373	1	CAPACITOR, 33 MFD, 35V (C3)
4	014-1094	2	CAPACITOR, 1000 MFD, 50V (C1, C2)
3	203-4005	2	IN4005 DIODE (D2, D3)
2	227-7824	1	24V REGULATOR (IC-1)
1	C-514-1391	1	BLANK P.C. BOARD
	B-914-1391		POWER SUPPLY P.C. BOARD ASSY

PARTS LIST

BROADCAST ELECTRONICS INC
- A FILMWAYS COMPANY -

1000/2000 SERIES
POWER SUPPLY PC ASSY
C-914-1391 REV B

DRAWN: 01/29/75 W.L.J. SCALE: 2/1



ITEM	PART NUMBER	QTY	DESCRIPTION
	914-1390	X	PLAYBACK/LOGIC P C BOARD ASSY
1	514-1390	1	BLANK P C BOARD
2	100-2763	2	RESISTOR, 270K Ω, 1/4W, 10% (R1, R2)
3	100-5653	4	56K Ω (R3, R13, R31, R32)
4	100-8233	2	820 Ω (R4, R5)
5	100-1023	2	10 Ω (R6, R7)
6	100-1563	1	150K Ω (R8)
7	100-3363	1	330K Ω (R11)
8	100-1053	3	10K Ω (R12, R49, R50)
9	100-2753	3	27K Ω (R15, R16, R23)
10	100-4753	7	47K Ω (R17, R18, R19, R20, R45, R57, R59)
11	100-4743	6	4.7K Ω (R21, R28, R33, R39, R43, R44)
12	100-1863	1	180K Ω (R27)
13	100-1843	1	1.8K Ω (R29)
14			
15			
16	100-6233	1	620 Ω (R37)
17	100-1033	1	100 Ω (R41)
18	100-2073	1	2.0 MEG Ω (R46)
19	100-3943	2	3.9K Ω (R47, R48)
20	100-2743	2	2.7K Ω (R51, R52)
21	100-2223	1	22 Ω (R53)
22	100-1543	1	1.5K Ω (R55)
23	100-3953	1	39K Ω, 1/4W, 10% (R58)
24	132-5622	1	RESISTOR, 56 Ω, 2W, W.W, 10% (R56)
25	177-1073	1	TRIMMER, 1.0 MEG Ω, .1W, 20% (R9)
26	177-5053	1	TRIMMER, 50K Ω, .1W, 20% (R10)
27	177-1053	2	TRIMMER, 10K Ω, .1W, 20% (R14, R24)
28			
29			
30			
31	040-2723	2	CAPACITOR, 270 pf, 50V (C1, C2)
32	064-1063	4	1 MFD, 35V (C3, C4, C5, C33)
33	015-5064	6	4.7 MFD, 50V (C6, C7, C14, C15, C16, C18)
34	030-4733	9	.0047 MFD, 100V (C8, C9, C10, C11, C12, C13, C26, C27, C28)
35	064-4763	4	4.7 MFD, 35V (C17, C19, C29, C35)
36	030-2033	1	.0022 MFD, 100V (C21)
37	064-3373	2	CAPACITOR, 33 MFD, 35V (C24, C25)

PARTS LIST

ITEM	PART NUMBER	QTY	DESCRIPTION
38	030-1043	1	CAPACITOR, .01 MFD, 100V (C39)
39	014-1084	1	100 MFD, 40V (C32)
40	030-4743A	1	.047 MFD, 100V (C38)
41			
42	013-4783	1	CAPACITOR, 470 MFD, 25V (C41)
43			
44	413-1597	15	TURRET TERMINAL
45	201-0457V	3	IN457 DIODE (D1, D2, D6)
46	203-4005	3	IN4005 DIODE (D7, D8, D9)
47	211-6566	4	TRANSISTOR MPS 6566 (Q2, Q3, Q5, Q6)
48	211-5816	2	TRANSISTOR 2N5816 (Q7 Q8)
49			
50			
51			
52			
53			
54			
55			

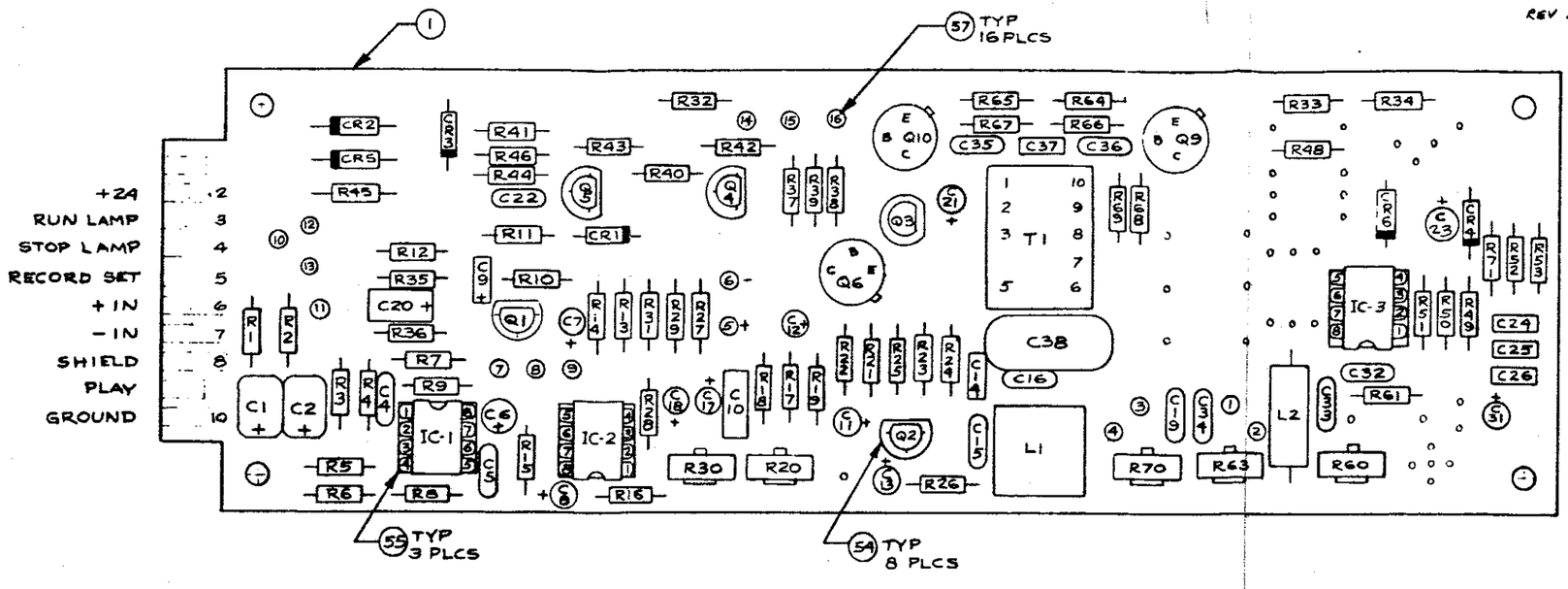
ITEM	PART NUMBER	QTY	DESCRIPTION
40	212-5462	1	2N5462 F.E.T. (Q1)
50	409-0121	5	TRANSISTOR PADS
51	417-0330	2	TRANSISTOR SOCKETS
52	221-2310	1	DUAL LOW NOISE PREAMP (IC-)
53	221-4558	2	DUAL OP-AMP (IC-2, IC-3)
54	417-1400	1	14-PIN DIP IC SOCKET
55	417-0800	2	8-PIN DIP IC SOCKET

BROADCAST ELECTRONICS, INC.
- A FILMWAYS COMPANY -

1000 SERIES
PLAYBACK/LOGIC P C ASSEMBLY
REV
C-915-1390

DRAWN: 8/1/75 M. C.S.
CHECKED:
SCALE: 2:1

REV A ECN 467 4/22/75



ITEM	PART NUMBER	QTY	DESCRIPTION
59	364-0670	1	CHOKE, 10 MHY (L2)
58	363-9061	1	INDUCTOR, ADJUSTABLE, 8-20 MHY (L1)
57	413-0024	16	TERMINAL, TURRET
56	372-0095	1	TRANSFORMER, BIAS OSCILLATOR (T1)
55	417-0800	3	SOCKET, IC, 8-PIN DIP
54	417-0330	8	SOCKET, TRANSISTOR
53			
52	221-4558	2	RC-4558 DUAL OP-AMP (IC-2, IC-3)
51	221-7091	1	LM-709 CN OP-AMP (8PIN DIP) (IC-1)
50	203-0457V	6	DIODE, IN457 (CR1, CR2, CR3 CR4, CR5, CR6)
49	211-3053	3	TRANSISTOR, 2N3053 (Q6, Q9, Q10)
48	210-3644		TRANSISTOR 2N5817 (Q3)
47	211-6566	3	TRANSISTOR, MPS6566 (Q2, Q4, Q5)
46	212-5462	1	FET, 2N5462 (Q1)
45			
44	030-2043		CAPACITOR, .02 MFD, 100 V (C38)
43	030-4733	2	.0047 MFD, 100V (C35, C36)
42	040-2422	1	240 pf, 50V (C33)
41			
40	030-4743A	3	.047 MFD, 100V (C24, C25, C26)
39	041-5023	2	500 pf, 500V (C19, C34)
38	040-1522	1	150 pf, 50V (C16)
37	030-1043	3	.01 MFD, 100V (C14, C22, C37)
36	064-1063	2	1 MFD, 35V (C1, C31)
35	030-3033	1	.003 MFD, 100V (C10)
34	064-3373	3	33 MFD, 35V (C9, C21, C23)
33	064-4763	7	4.7 MFD, 35V (C6, C7, C8, C12, C13, C17, C18)
32	040-2213	1	22 pf, 50V (C5)
31	040-2223	3	220 pf, 50V (C4, C15, C32)
30	063-1083	3	CAPACITOR, 100 MFD, 20V (C1, C2, C20)
29	100-8263	1	RESISTOR, 820KΩ, 1/4W, 10% (R71)
28	176-1054	1	TRIMMER, SIDE ADJ, 10KΩ, .1W, 20% (R30)
27	176-2054	1	TRIMMER, SIDE ADJ, 20KΩ, .1W, 20% R60)
26	176-1064	3	TRIMMER, SIDE ADJ, 100KΩ, .1W, 20% (R20, R63, R70)
25	100-8253	1	RESISTOR, 62KΩ, 1/4W, 5% (R51)
24			
23		1	
22	100-5653	3	56KΩ (R1, R2, R16)
21	100-4753	4	47KΩ (R15, R32, R45, R46)
20	100-4743	8	4.7KΩ (R11, R18, R19, R33, R34, R35, R36, R37)
19	100-4733	2	RESISTOR, 470Ω, 1/4W, (R3, R4)
18	100-2743	2	RESISTOR, 2.7KΩ, 1/4W, (R26, R27)
17	100-3953	2	39KΩ (R17, R44)
16	100-3943	2	3.9KΩ (R42, R43)
15	100-3333	1	330Ω (R52)
14	100-2763	1	270KΩ (R21)
13	100-2723	2	27Ω (R64, R65)
12	100-2263	1	220KΩ (R31)
11	100-2253	5	22KΩ (R22, R40, R41, R68, R69)
10	100-2243	1	2.2KΩ (R23)
9	100-2223	1	22Ω (R39)
8	100-1553	1	15KΩ (R53)
7	100-1543	1	1.5KΩ (R9)
5	100-1063	4	100KΩ R12, R7, R8, R13, R28)
4	100-1053	8	10KΩ (R10, R25, R29, R38, R48, R49, R50 R61)
3	100-1043	4	1KΩ (R14, R24, R66, R67)
2	100-1033	2	RESISTOR, 100Ω, 1/4W, (R5, R6)
1	C-514-1393	1	BLANK P C BOARD
	C-915-1393		RECORD MODULE P C BOARD ASSY
ITEM	PART NUMBER	QTY	DESCRIPTION

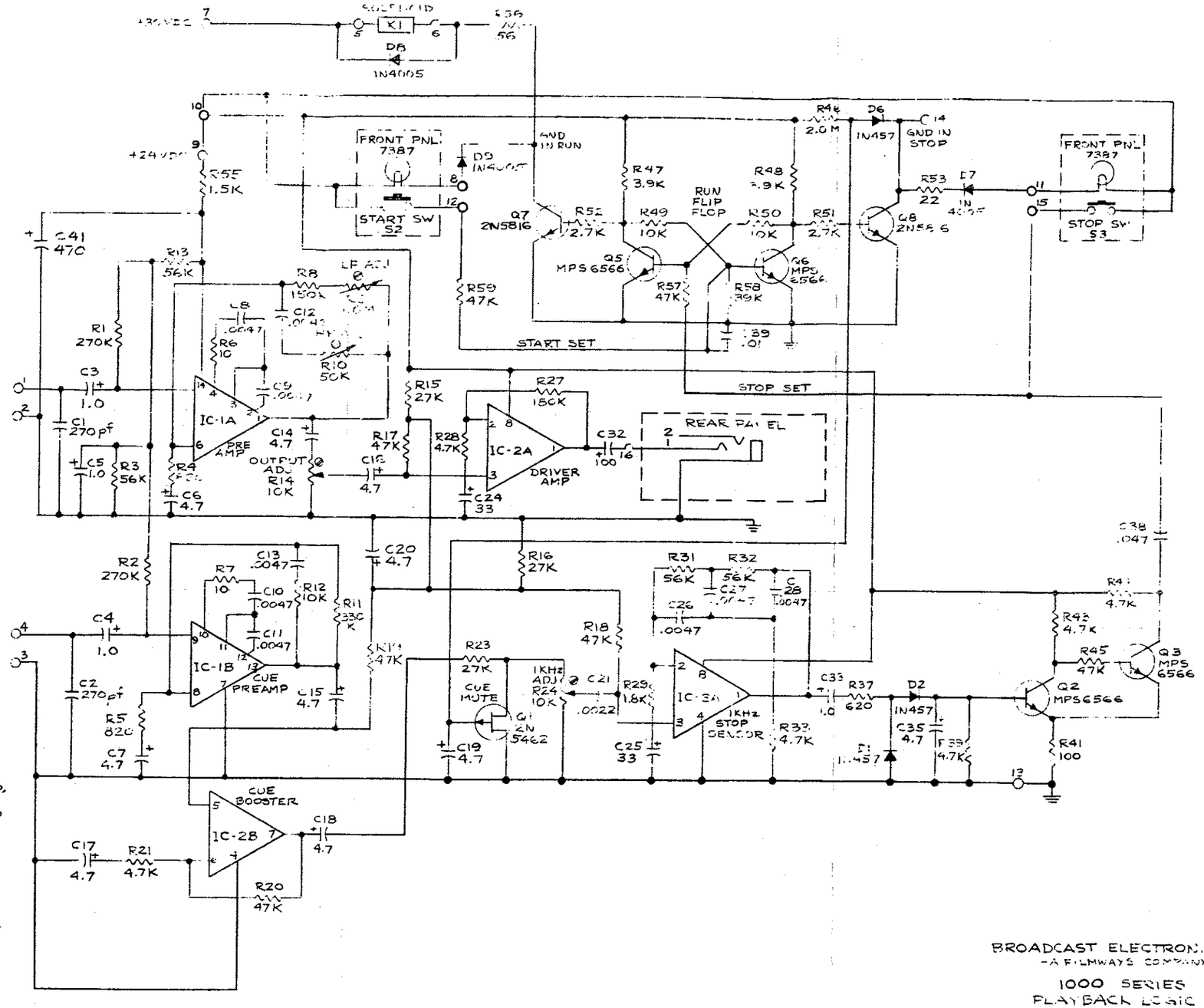
PARTS LIST

BROADCAST ELECTRONICS, INC.
- A FILMWAYS COMPANY -

1000 SERIES
RECORD MODULE
P C BOARD LAYOUT & PARTS

REV
C-915-1393 A

DRAWN: 12/24/74 W.L.J.
TRACED:
SCALE: 2:1



NOTES;

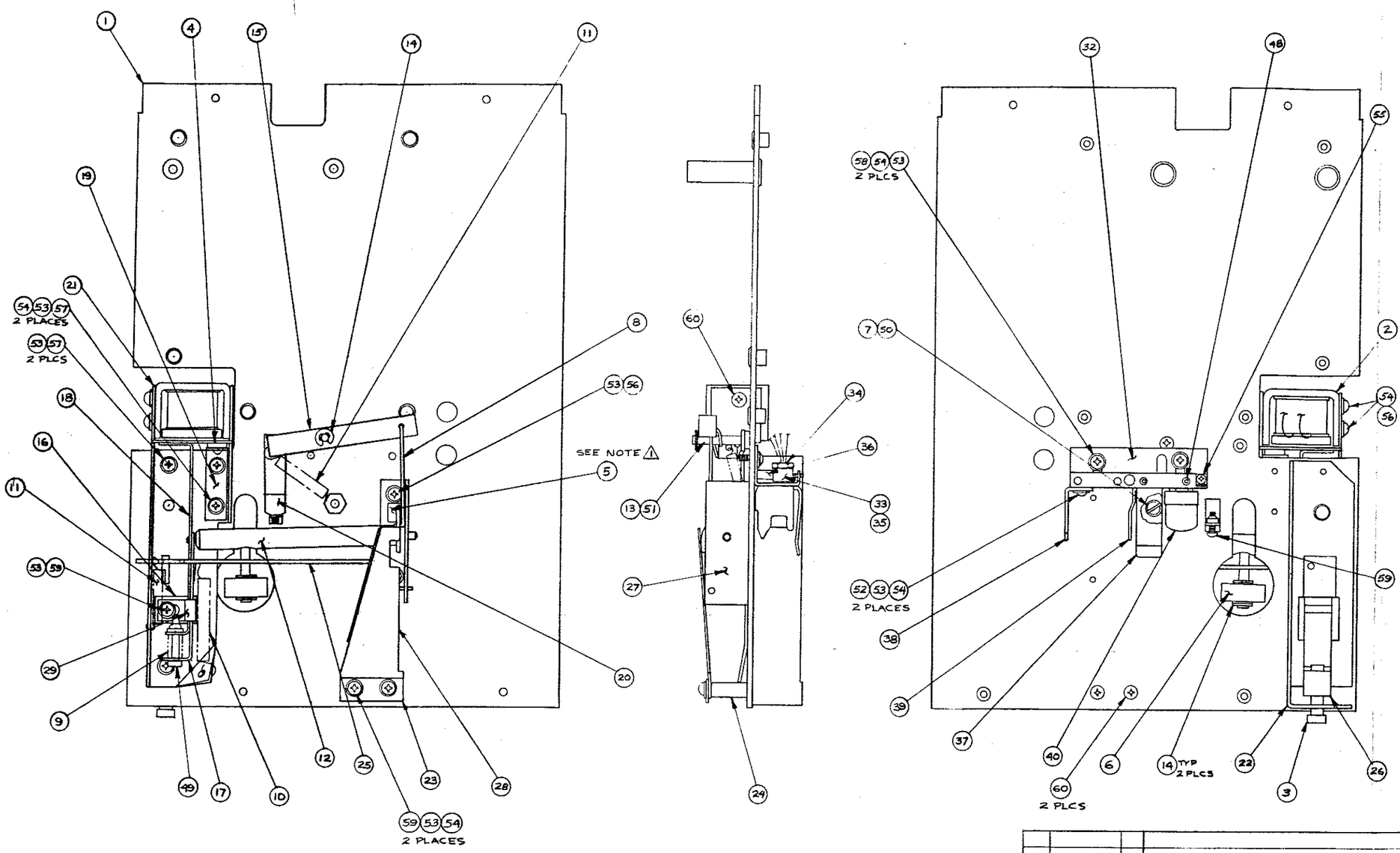
1. RESISTORS IN OHMS, 1/4W; CAPACITORS MFD, UNLESS NOTED OTHERWISE.
2. ——

BROADCAST ELECTRONICS, INC
-A FILMWAYS COMPANY-

1000 SERIES
PLAYBACK LOGIC PCB
MONO
SCHEMATIC

C-906-1102

DRAWN: 11/19/74 RLB



NOTES :

1. APPLY ITEM 5 USING CARTER'S RUBBER CEMENT #845 (OR EQUAL) IN APPROXIMATE POSITION SHOWN.

ITEM	PART NUMBER	QTY	DESCRIPTION
60	——	3	FHMS, PHIL #6-32 X 3/16
59	——	4	PHMS, PHIL X 3/8
58	——	2	X 5/16
57	——	4	X 1/4
56	——	5	#6-32 X 3/16
55	——	1	PHMS, PHIL #4-40 X 3/8
54	——	12	F/WASHER, #6
53	——	8	L/WASHER, #6 INT TEETH
52	——	2	PHMS, PHIL #4-40 X 1/4
51	——	1	FHMS, PHIL #4-40 X 1/4
50	——	1	HEX NUT #8-32
49	——	1	SOCKET HD MACH SCR #6-32 X 7/8
48	——	2	SET SCREW #4-40 X 1/4

ITEM	PART NUMBER	QTY	DESCRIPTION
47			
46			
45			
44			
43			
42			
41			
40	252-0001	1	HEAD, DMIB
39	B-452-0103	1	L/R COMBINED CARTRIDGE GUIDE
38	B-452-2101	1	LEFT CARTRIDGE GUIDE
37	B-459-0002	1	CARTRIDGE SPRING
36	A-430-0053	1	SPRING, BLOCK
35	A-436-0052	1	CONICAL WASHER
34	A-421-0003	1	CLAMP NUT
33	A-449-0050	1	CLAMP BLOCK
32	B-470-0049	1	HEAD BRACKET
31			
30			
29	A-459-0021	1	GUIDE STRAP
28	A-459-4107	1	LATCH
27	A-459-4097	1	PIVOT ANGLE
26	A-459-4115	1	CLAMP, RELEASE BUTTON
25	A-429-4101	1	RELEASE CRANK
24	A-422-0035	1	LATCH STANDOFF
23	A-459-0048	1	NUT BAR SPACER
22	A-472-0015	1	CARTRIDGE GUIDE
21	C-470-0013	1	SOLENOID BRACKET
20	B-459-0046	1	PUSHLINK ASSEMBLY
19	B-459-0040	1	BUMPER STRAP
18	B-459-0025	1	ARMATURE ASSEMBLY
17	A-459-0022	1	SHAFT, PIVOT STRAP
16	A-459-0020	1	SPACER, GUIDE
15	A-459-0012	1	LEVER, PIVOT ACTUATING
14	454-3318	3	E-RING
13	B-449-0070	1	PIVOT POST
12	B-446-1113	1	SHAFT ASSEMBLY
11	B-432-0045	2	SHAFT RETURN SPRING
10	B-432-0044	1	ARMATURE RETURN SPRING
9	430-0046	1	SPRING
8	A-429-0016	1	WIRE LINK
7	420-0112	1	CARTRIDGE STOP PIN SCREW
6	B-404-0001	1	PRESSURE ROLLER ASSEMBLY
5	403-0042	1	CUSHION, CAM
4	403-0038	1	PLUG BUMPER
3	A-442-4200	1	RELEASE BUTTON
2	B-289-0033	1	SOLENOID ASSEMBLY
1	C-530-0000	1	DECK PLATE
	D-906-2108		DECK PLATE ASSEMBLY

PARTS LIST

BROADCAST ELECTRONICS, INC.
- A FILMWAYS COMPANY -

1000/2000 SERIES

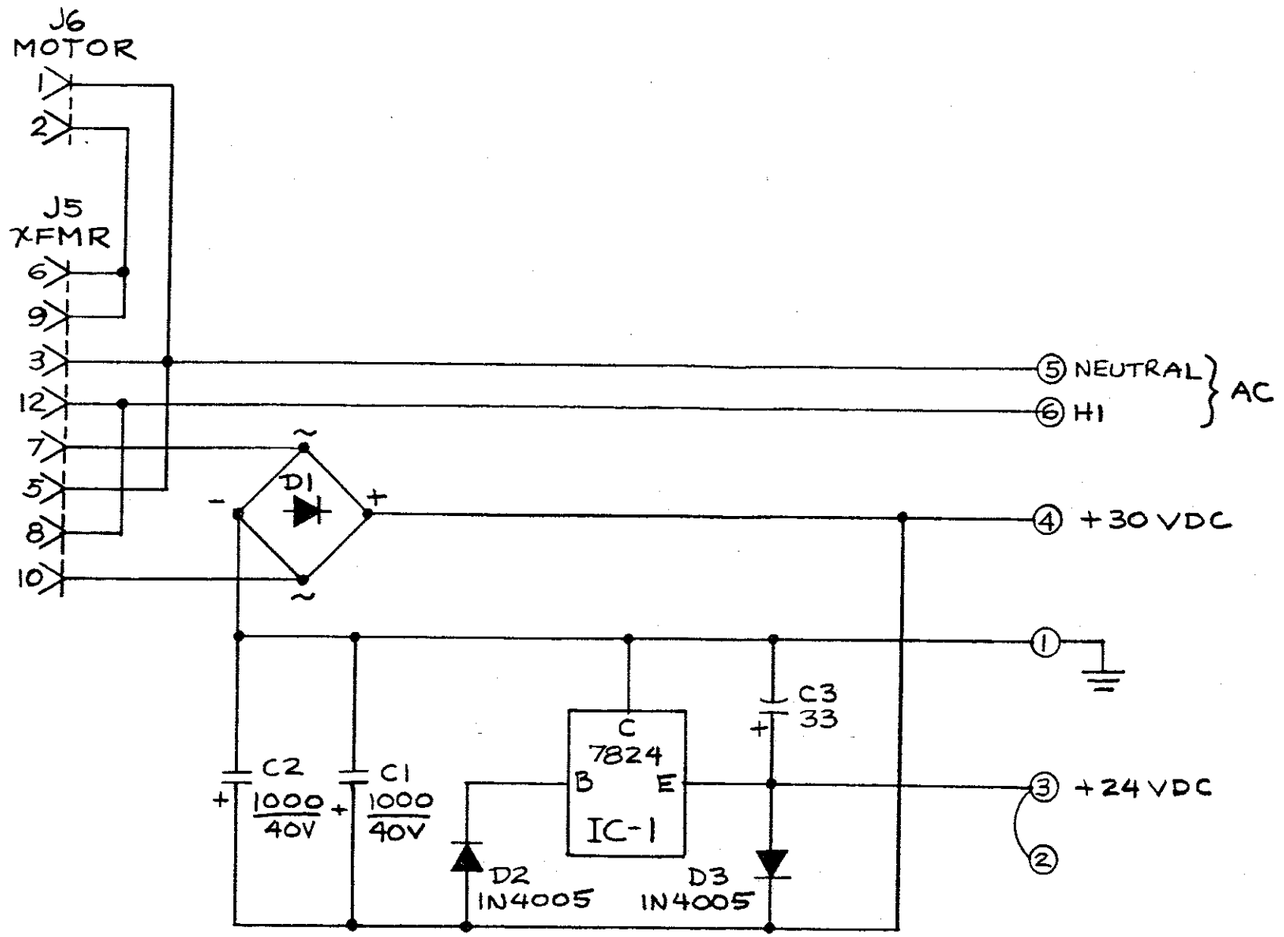
DECK PLATE ASSEMBLY

D-906-2109

DRAWN: 12/8/74 7438
CHECKED:

SCALE: 1:1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



ITEM	QTY RQD	PART NUMBER	DESCRIPTION	NOTE

LIST OF MATERIAL

TOLERANCE UNLESS OTHERWISE SPECIFIED
DECIMAL 2 PL=.01 3PL=.005
FRACTIONAL ± 1/64
ANGULAR ± 1°
SHARP EDGES TO
BEND RADII
FILLET RADII

MATERIAL —

TREATMENT OR FINISH —

DRAWN BY msd DATE 5/22/75
CHECKED BY [illegible] DATE 5-23-75
PROJECT ENGR DATE
APPROVED BY

BROADCAST ELECTRONICS INC.
—A FILMWAYS COMPANY—

TITLE POWER SUPPLY PCB SCHEMATIC

B | DWG NO. 906-2114 | REV

1000/2000 SERIES | SCALE — | SHEET 1 OF 1

PRODUCT WARRANTY

LIMITED ONE YEAR

While this warranty gives you specific legal rights, which terminate one (1) year (6 months on turntable motors) from the date of shipment, you may also have other rights which vary from state to state.

Broadcast Electronics, Inc. ("BE"), 4100 North 24th Street, P. O. Box 3606, Quincy, Illinois 62305, hereby warrants cartridge machines, consoles, transmitters and other new Equipment manufactured by BE against any defects in material or workmanship at the time of delivery thereof, that develop under normal use within a period of one (1) year (6 months for turntable motors) from the date of shipment. Other manufacturers' Equipment, if any, shall carry only such manufacturers' standard warranty. This warranty extends to the original user and any subsequent purchaser during the warranty period. BE'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. BE'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 the original user 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 BE, or if Equipment is operated under environmental conditions or circumstances other than those specifically described in BE's product literature or instruction manual which accompany the Equipment purchased. BE shall not be liable for any expense of any nature whatsoever incurred by the original user without prior written consent of BE.

BE shall not be liable to the original user 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 you. All express and implied warranties shall terminate at the conclusion of the period set forth herein.

Except as set forth herein, and except as to title, there are no warranties, or any affirmations of fact or promises by BE, 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 in BE's product literature or instruction manual which accompany the Equipment. Any card which is enclosed with the Equipment will be used by BE for survey purposes only.

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