

SECTION 2
INSTALLATION

NOTE

Before operating the equipment read this
SECTION and SECTION 3, OPERATION.

GENERAL

The 351 Series equipment is shipped mounted in consoles or portable cases after a thorough inspection and performance check at the factory. In the event that the equipment is requested disassembled, for customer rack mounting, all assembly hardware is provided.

INTERCONNECTING

See the appropriate interconnecting diagrams at the back of this section.

MOUNTING

Console Models

To assemble the console model proceed as follows:

- Step 1: Install the tape transport in the cabinet frame, securing the 8 oval-head screws and finishing washers.
- Step 2: Place the two springs in the holes for the electronic assembly cabinet frame.
- Step 3: Attach the two rails to the electronic assembly using the number 8 screws.
- Step 4: Slide the cabinet back panel up and out to allow connecting of the a-c power cable and plug the input cable and the output cable into their receptacles on the back of the electronic assembly.
- Step 5: Install the electronic assembly, tightening the four knurled nuts to fasten it to the frame.
- Step 6: Connect the captive head cables at their locations on the electronic assembly.
- Step 7: Connect the captive CABLE TO ELECTRONICS to the electronic assembly.
- Step 8: Replace the back panel, making certain that all cables run freely through the semi-circular cut-outs at the bottom of the sliding panel.



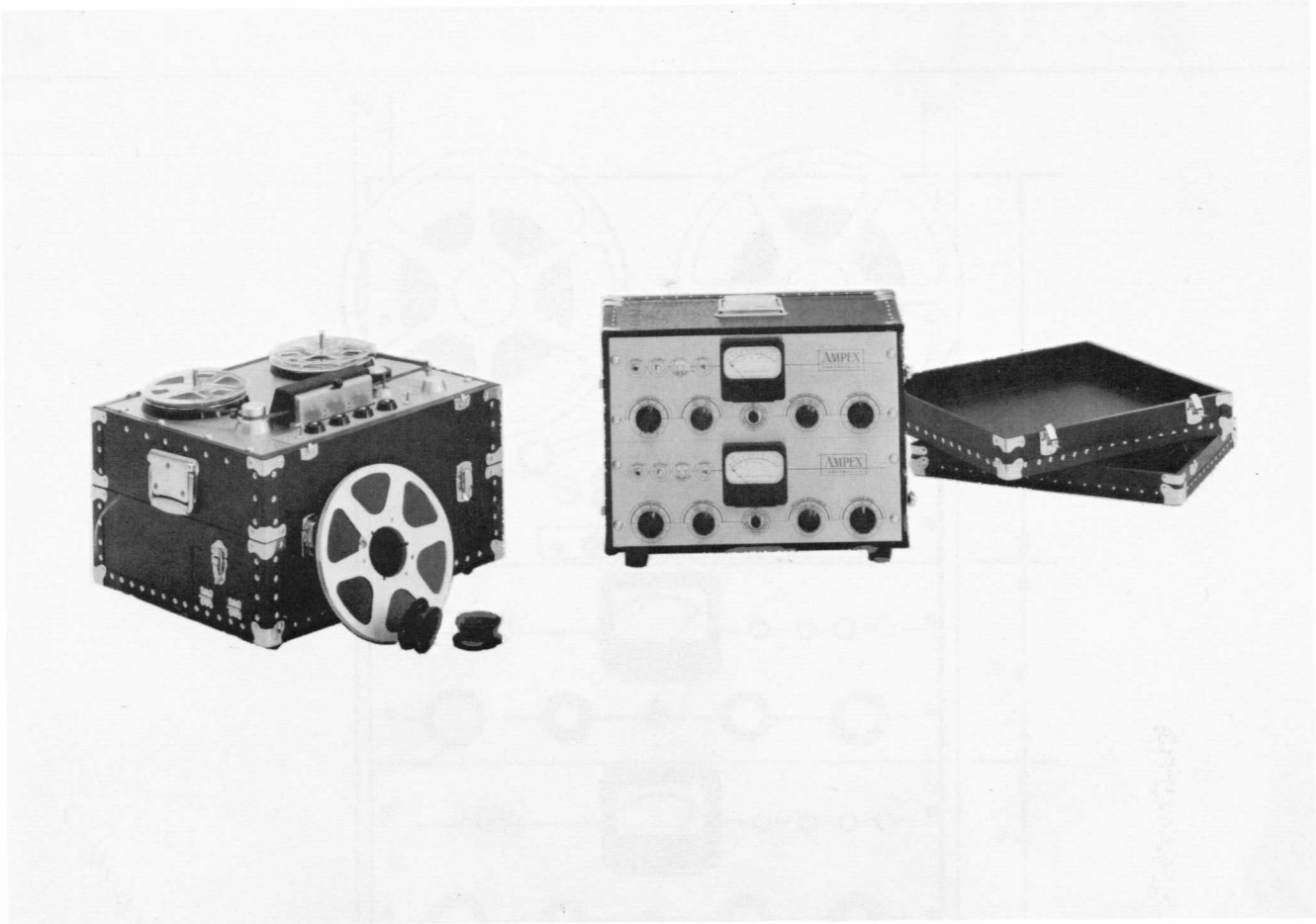
351-IN-1

CONSOLE MODEL

Two Case Portable Models (For 351-2 see the applicable INTERCONNECTING illustration at the back of this SECTION).

The two case portable models are shipped in a ready to operate condition, except for the connection of interconnecting cables. Convenient rubber feet are located at both ends of each case, and metal rests are provided on the backs of each case. To set up the equipment follow these steps:

- Step 1: Arrange the cases so that the mechanical assembly case is to the right of the electronic assembly case.
- Step 2: Unlatch and remove the top cover and the side access door on the mechanical assembly case.



351-1N-2

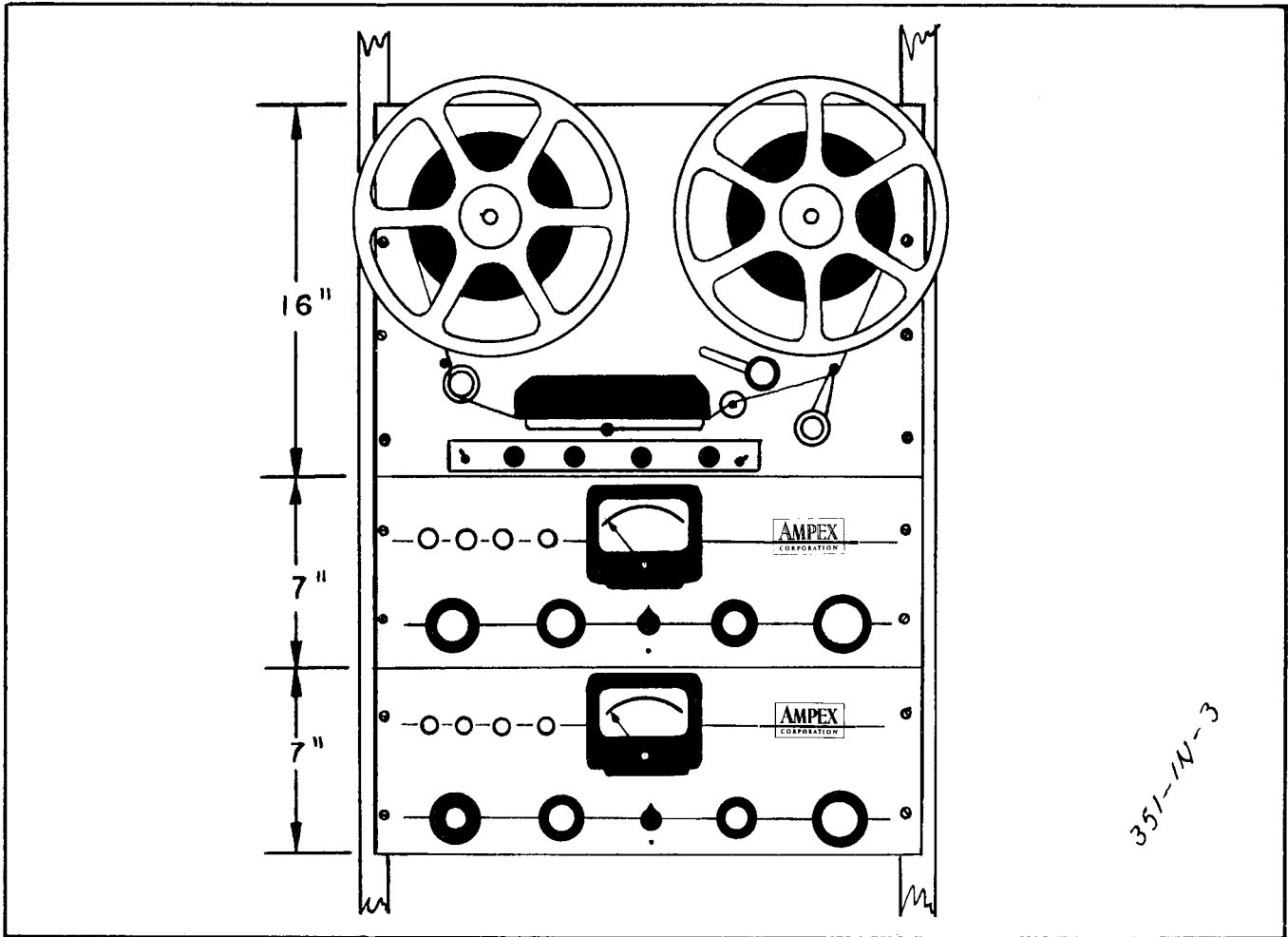
TWO CASE PORTABLE EQUIPMENT

- Step 3: Unlatch and remove the front and rear covers on the electronic assembly case.
- Step 4: Uncoil the interconnecting cables from behind the cable access door on the tape transport case and plug them into mating receptacles at the rear of the electronic assembly.
- Step 5: Connect the a-c power, and the input and output to the rear of the electronic assembly.

Rack Mounted Models

Mount these versions of the equipment on a standard 19-inch relay rack with the mechanical assembly above the main electronic panel.

The 351-2 equipment can be mounted as shown in the illustration.



TYPICAL RACK LAYOUT

POWER CONNECTION

Connect the power cable from the a-c POWER input connector, J8, on the electronic assembly to a convenient 115 volt a-c power source.

OUTPUT

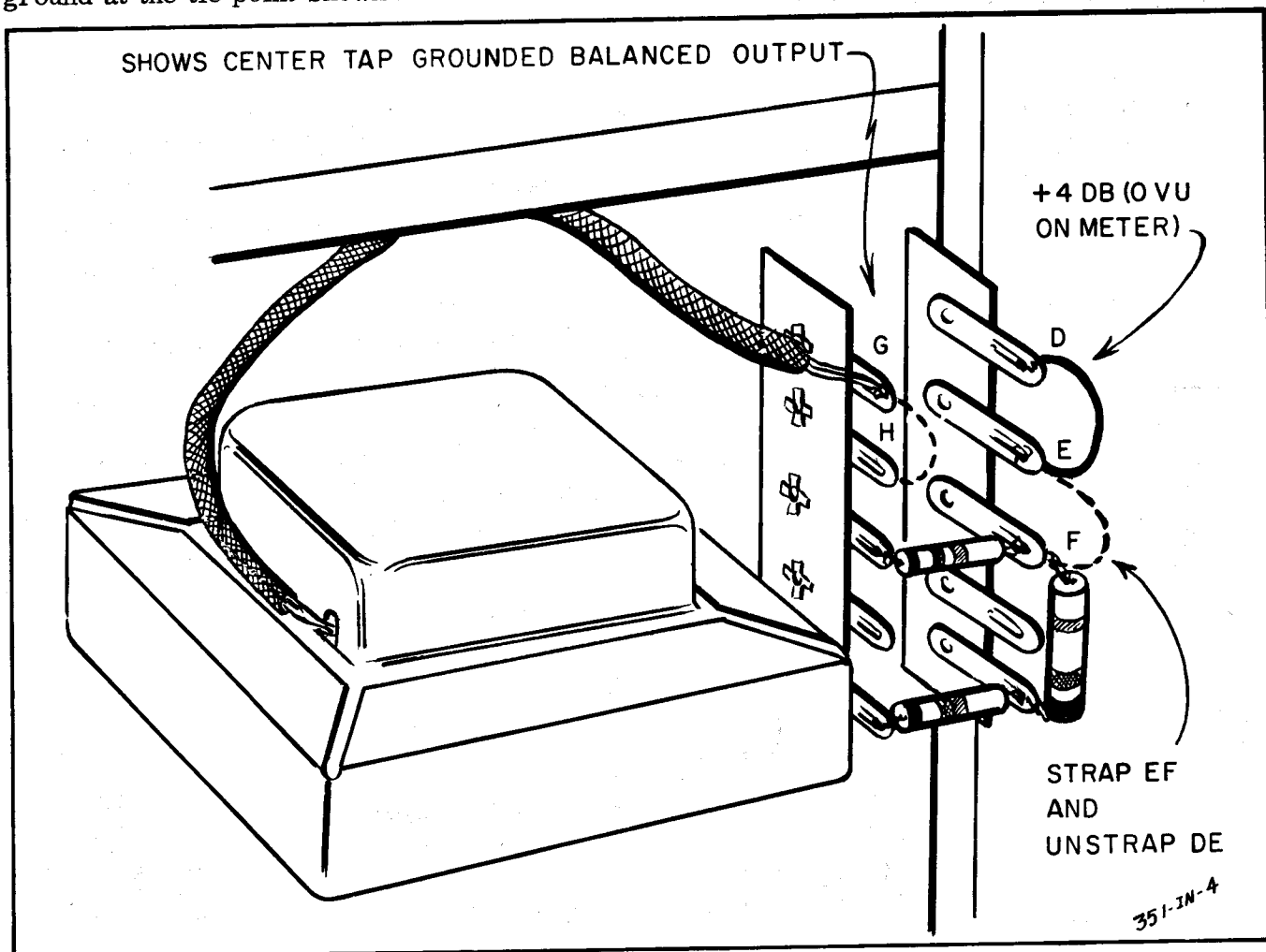
A mating connector for LINE OUTPUT is supplied. The user must fabricate his own cables.

Studio Line

Plus 8 v-u, 600 ohm line output, balanced or unbalanced, is available across terminals 2 and 3 of the line out connector, J5. Pin 1 is the chassis ground.

If unbalanced output is desired, wire the mating connector so that the pin 2 side of the line is tied to ground or tie A to B at TS1. Supply 600 ohm termination to this output at all times to maintain correct meter calibration while recording or reproducing. If the output is not feeding a terminated line, or if the output is not connected, such as on remote pickups, the line out termination switch, S4, must be left in the ON position.

To obtain a center tap, grounded balanced output, strap the black lead of transformer T3 to ground at the tie point shown in the illustration.



CENTER TAP GROUNDED BALANCED OUTPUT
AND STRAPPING FOR 4 VU OUTPUT

Plus 4 v-u output can be achieved by unstrapping D and E at transformer T3 and strapping E to F. Readjust the record calibration according to the instructions in SECTION 5 ALIGNMENT AND PERFORMANCE CHECKS.

High Impedance Amplifier Input

Wire the mating connector so that pin 3 of the line out connector, J5 is connected to the high side of the amplifier input. Strap pins 1 and 2 of the mating connector for connection to the ground side of the amplifier input. The line out termination switch S4, must be left in the ON position at all times.

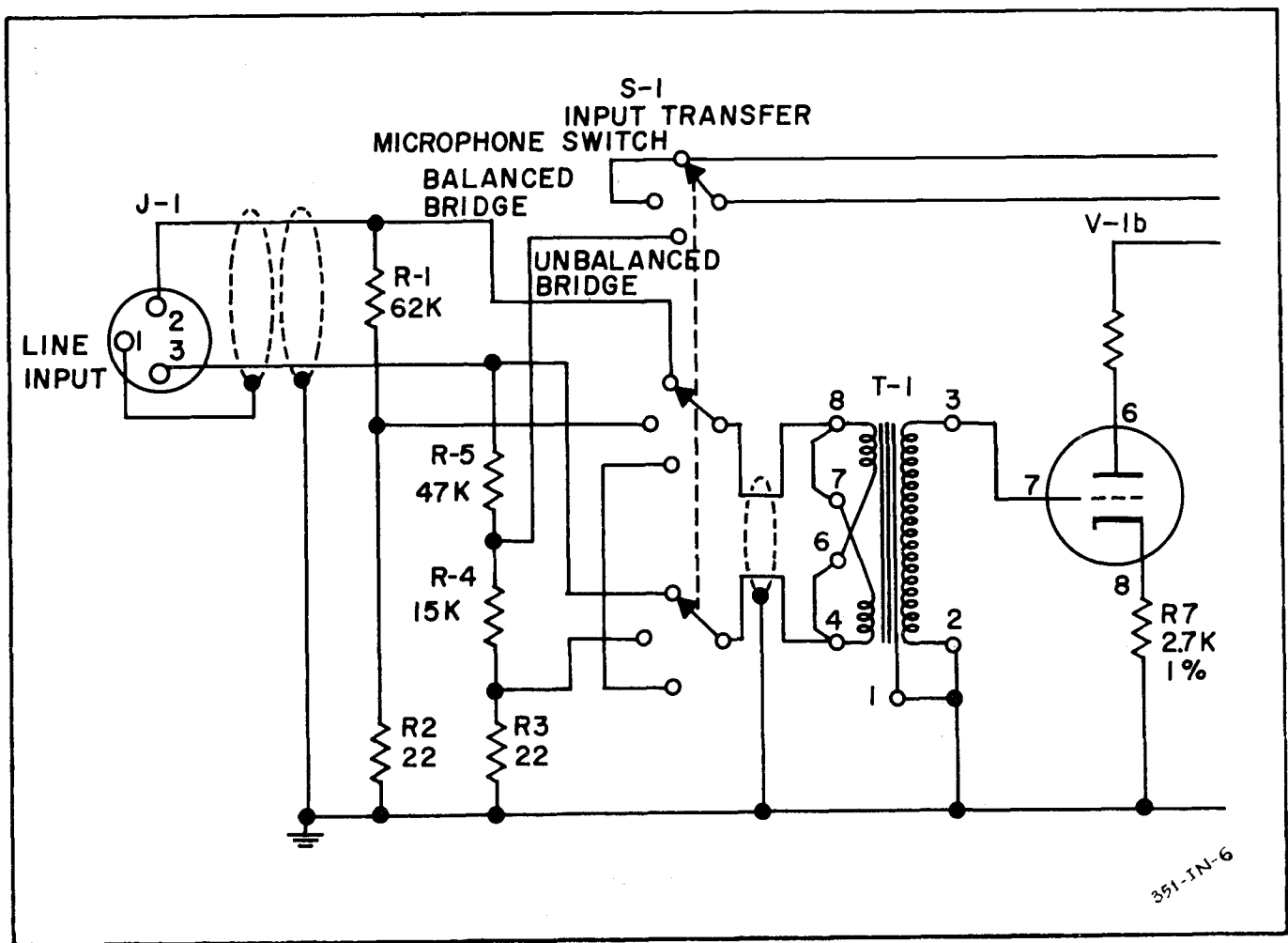
INPUT

During this discussion refer to the foldout illustration - Schematic Diagram - Electronic Assemblies at the back of SECTION 5.

Microphone Input

Any low impedance microphone having a nominal impedance between 30 and 250 ohms can be plugged directly into the equipment. Wire the mating connector so that the microphone is connected to pins 2 and 3 of LINE INPUT, J1. The cable shield must be connected to pin 1. Place the input transfer switch, S1, in the MIC position.

The microphone input transformer is strapped for the optimum step up when using a 150 to 250 ohm source. With microphones of 50 ohms or less impedance, to obtain 6 db additional gain strap the input as shown.



MICROPHONES WITH 50 OHMS
OR LESS IMPEDANCE

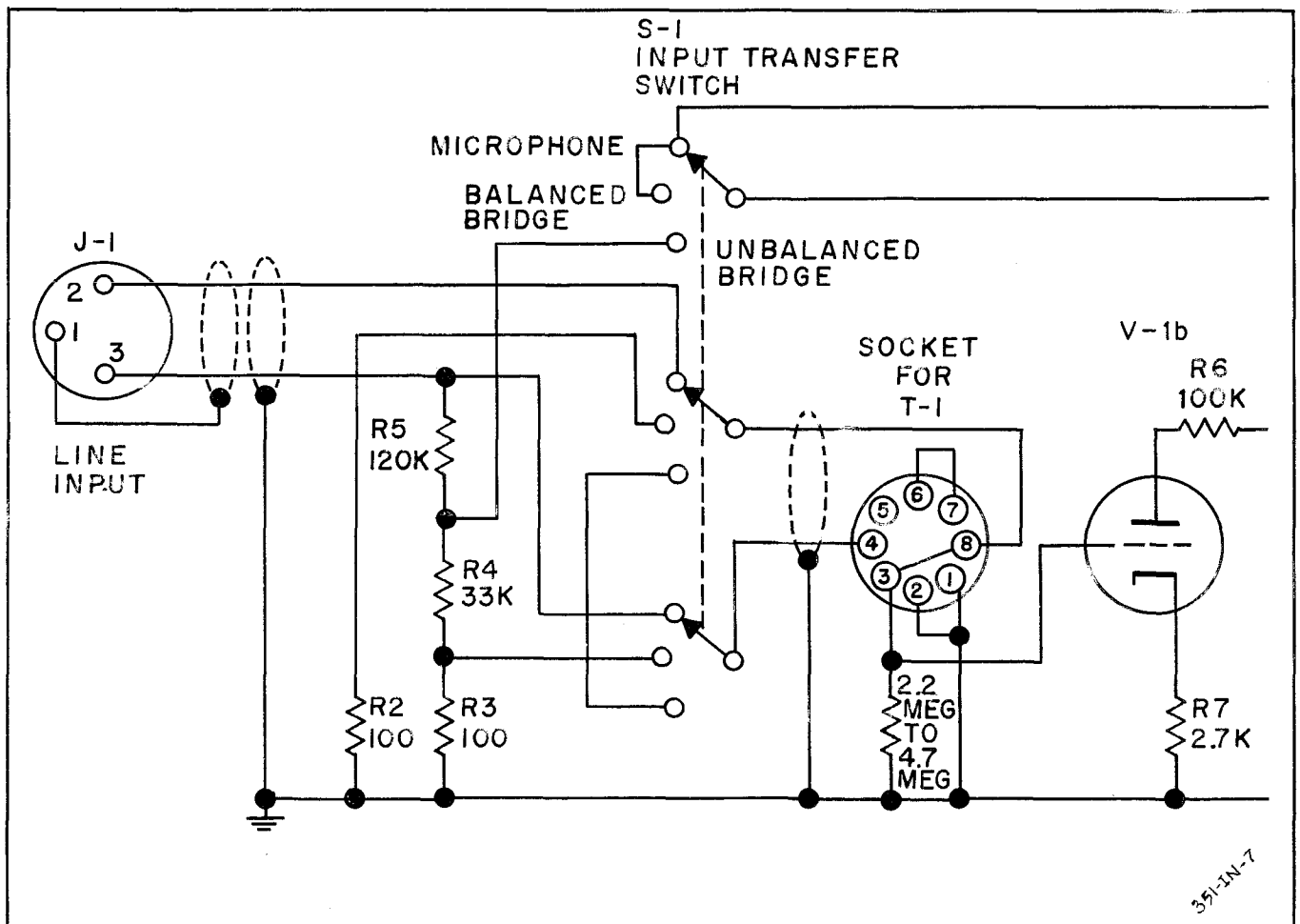
This should be done only if insufficient gain is found to exist when the input is fed from a source impedance greater than 50 ohms.

IMPORTANT

To maintain flat response in the balanced bridge condition when the transformer is strapped for 50 ohms, change resistor values of the following:

- R1 -- 62K ohms
- R2 -- 22 ohms
- R3 -- 22 ohms
- R4 -- 15K ohms
- R5 -- 47K ohms

High impedance microphones are not recommended for use in this equipment because, in general, the quality is not satisfactory for professional work. If it becomes necessary to connect a high impedance microphone, the input circuit must be re-wired as shown below:



HIGH IMPEDANCE MICROPHONE INPUT

- Step 1: Remove the input transformer T1.
- Step 2: Remove the 150,000 ohm resistor R1 from the switch S1.
- Step 3: Between pin 3 and pin 1 on the input transformer socket, connect a resistance the value of which is between 2.2 megs and 4.7 megs.
- Step 4: Using a jumper connect pin 3 to pin 8 on the transformer socket.
- Step 5: Wire the microphone input connector for connection to pins 1 and 2 (shield to pin 1), and leave pin 3 open.

Bridging a Balanced Studio Line

Connect a balanced line to pins 2 and 3 of the input connector, J1. Pin 1 is ground. Place the input transfer switch, (S401) in the BALANCED BRIDGE position. Input levels of minus 10 to plus 20 v-u can be accommodated. The load placed on the line is approximately 300,000 ohms.

Bridging an Unbalanced Source

Connect an unbalanced line, radio tuner, etc., to pins 1 and 3 of the input connector. Pin 1 is the ground side. Place the input transfer switch S1, in the UNBALANCED BRIDGE position. This connection provides a 140,000 ohm bridging input for any rms program voltage greater than .2 volt.

Gain Changes in Balanced Bridge or Unbalanced Bridge

An increase of 10 db in balanced and unbalanced bridge can be achieved by changing two resistors. Change R1 to 47,000 ohms and R5 to 15,000 ohms. The resulting input impedances will be 100,000 ohms in the balanced bridge position and 40,000 ohms in the unbalanced bridge position.

An increase of 14 db unbalanced bridge gain without changing balanced bridge gain can be obtained by shorting out resistor R5 and changing R4 to 150,000 ohms. Resulting input impedance will be 60,000 ohms.

For a 10 db increase in balanced bridge gain without changing unbalanced bridge gain, change resistor R1 to 47,000 ohms, R5 to 39,000 ohms and R4 to 10,000 ohms. Resulting input impedances will be 100,000 ohms for balanced bridge and 50,000 ohms for unbalanced bridge.

SUMMARY

<u>For Gain Increase</u>	<u>Component</u>	<u>New Value</u>	<u>New Input Impedance</u>	
			<u>BAL BRIDGE</u>	<u>UNBAL BRIDGE</u>
10 db BAL BRIDGE and UNBAL BRIDGE	R1	47,000 ohms	100,000 ohms	40,000 ohms
	R5	15,000 ohms		
14 db UNBAL BRIDGE	R5	zero (short out)	300,000 ohms	60,000 ohms
	R4	15,000 ohms		
10 db BAL BRIDGE	R1	47,000 ohms	100,000 ohms	50,000 ohms
	R5	39,000 ohms		
	R4	10,000 ohms		

PHONES

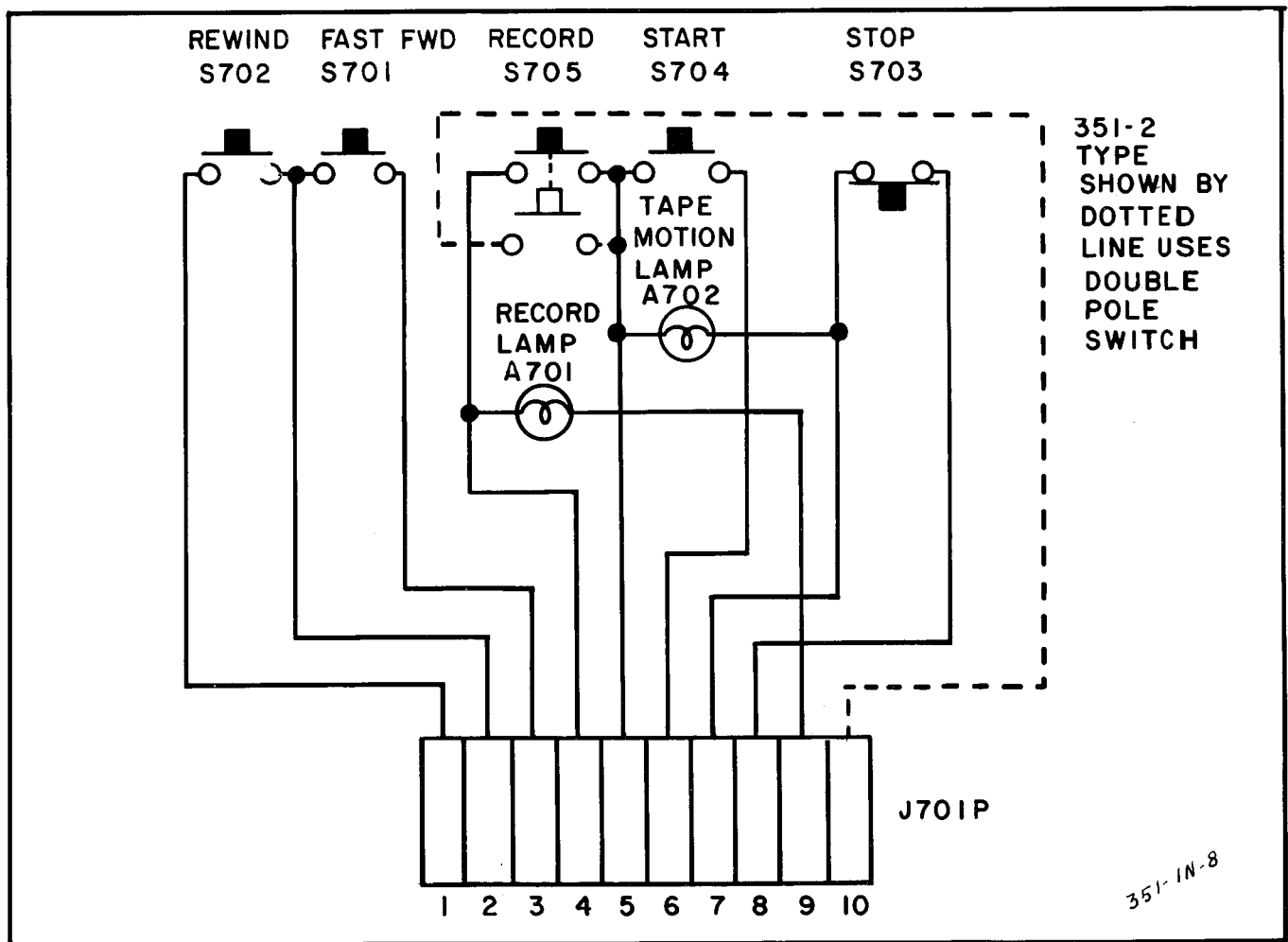
High impedance head phones must be used. To monitor the incoming line or reproduce output, plug the high impedance phones into phone jack J6 PHONES on the amplifier face panel or J4 MONITOR on the back of the amplifier chassis.

REMOTE CONTROL

The operation of the tape transport mechanism can be remotely controlled by an Ampex Catalog No. 5763 or 5763-2 Remote Control Unit. The catalog No. 5763 or 5763-2 unit is supplied in a wooden case, completely wired and ready to plug into the remote control connector, J502S, on the tape transport circuits assembly. The catalog No. 5763-1 and 5763-3 units are mounted on a flat plate for installation in studio consoles, and are not wired. For Model 351-2, use only 5763-2 in the wooden or 5763-3 mounted on the flat plate. To install, wire as shown in the figure, and plug into J502S.

NOTE

Whenever the remote control unit is not connected, the dummy plug P502P, supplied with the equipment, must be plugged into J502S.



SCHEMATIC DIAGRAM ---
REMOTE CONTROL UNIT

60 CYCLE AMPLIFIER

The Ampex Model 375 Precision 60 Cycle Amplifier can be plugged directly into the equipment at J503S. No other connections are necessary. The Model 375 is used where power sources are erratic and there is need for a precision 60 cycle time base for driving the capstan.

CAUTION

If this unit is used with the recorder/reproducer, the control circuit fuse F402 must be increased to 5 amperes.

NOTE

Do not remove the dummy plug P503P unless the 60 cycle amplifier is connected.

OVERALL PERFORMANCE CHECK (Read SECTION 3, OPERATION before making these checks.)

Make the following equipment performance checks at the time of installation and when necessary thereafter:

REPRODUCE (Playback) LEVEL
REPRODUCE (Playback) RESPONSE
REPRODUCE (Playback) NOISE MEASUREMENT

RECORD CALIBRATION
FREQUENCY RESPONSE
RECORD NOISE MEASUREMENT

Complete instructions for making the above checks are given in SECTION 5 ALIGNMENT AND PERFORMANCE CHECKS.

DISTORTION

Overall distortion can be measured by connecting any standard distortion measurement apparatus across the output. The readings from a wave analyzer or selective frequency distortion meter will be more accurate than those from a null type instrument at lower distortion levels. Distortion readings are somewhat dependent on tape. A reading of 1% is normal at operating level while a reading of 3% is normal at 6 db above operating level. Second harmonic distortion is negligible; measured distortion is predominantly third order.

FLUTTER AND WOW

Flutter and wow are produced by periodic irregularities in tape speed and appear as cyclic frequency deviations in recording or reproduction. They can be measured by means of any standard flutter bridge. Variations in amplitude as indicated on level measurements do not constitute flutter and are entirely due to tape coating variations. Readings will be well under .14% rms at 15 inch, .18% rms at 7-1/2 inch, and .21% rms at 3-3/4 inch speed. The Ampex Professional Products Division primary standard of measurements is based on the use of a flutter meter calibrated to indicate the deviation from mean carrier frequency of any rate between .5 and 300 cps expressed in percent rms.

INTERCONNECTING
SINGLE TRACK

<u>Cable</u>	<u>Catalog Number</u>	<u>Qty.</u>	<u>Receptacle</u>	<u>From</u>	<u>Chassis</u>	<u>Receptacle</u>	<u>To</u>	<u>Chassis</u>
A-c	2413	(1)	J8 POWER		Electronic Assembly	A-c source		
Power Interconnecting	----	(1)	J7 TAPE TRANSPORT		Electronic Assembly	CABLE TO ELECTRONICS		Captive at Tape Transport
Reproduce Head		(1)	J3 PLAYBACK HEAD		Electronic Assembly			Captive at Tape Transport
Record Head		(1)	J2 RECORD HEAD		Electronic Assembly			Captive at Tape Transport
Erase Head		(1)	J10 ERASE HEAD		Electronic Assembly			Captive at Tape Transport

PORTABLE
SINGLE TRACK

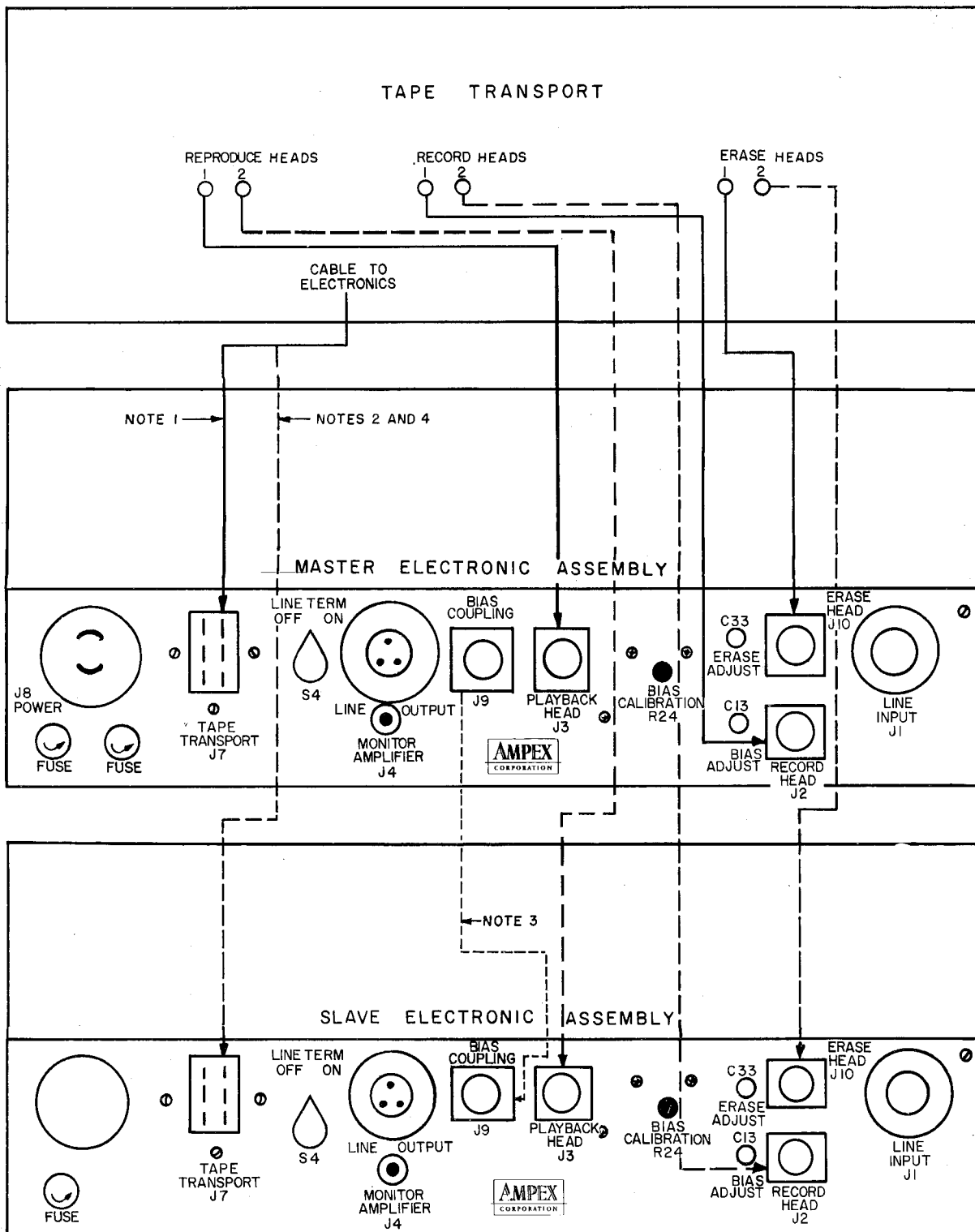
Power Extension	3768-1	(1)	J7 TAPE TRANSPORT		Electronic Assembly			End of Captive Tape Transport power interconnecting cable.
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DUAL TRACK EQUIPMENT (Unmounted)

Power Interconnecting	30812-01	(1)	J7 TAPE TRANSPORT		Electronic Assembly 1 and 2			End of Captive Tape Transport power interconnecting cable.
Bias Interconnecting	14943-02	(1)	J9 BIAS COUPLING	<u>From</u>	Master Electronic Assembly	J9 BIAS COUPLING	<u>To</u>	Slave Electronic Assembly

DUAL TRACK EQUIPMENT (Portable)

Power Interconnecting	30812-02	(1)	J7 TAPE TRANSPORT		Electronic Assembly 1 and 2			End of Captive Tape Transport power interconnecting cable.
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NOTES

1. A 3768-1 POWER EXTENSION CABLE IS USED WITH SINGLE TRACK PORTABLE EQUIPMENT.
2. A 30812-01 POWER INTERCONNECTING Y CABLE IS USED WITH DUAL TRACK STEREOPHONIC EQUIPMENT.
3. A 14943-02 BIAS INTERCONNECTING CABLE IS USED WITH DUAL TRACK STEREOPHONIC EQUIPMENT.
4. A 30812-02 POWER INTERCONNECTING CABLE IS USED WITH PORTABLE DUAL TRACK STEREOPHONIC EQUIPMENT.