

## INSTALLATION

### GENERAL

Open the packing case carefully and save it. In the event of possible shipping damage the case may be needed for return shipment. Install the equipment in the rack so that the head cables will reach the electronic unit without being extended in length. Do not lengthen the head cables for any reason whatsoever, because increased cable capacity will adversely effect frequency response. Install all cables as indicated in the applicable interconnecting instructions.

Release the capstan drive motor shipping lock—a spring catch holding the motor away from the rubber-tired flywheel. Break the retaining ring and remove the lock from the motor bracket. Do not make any adjustments on the drive system at this time (none should be needed unless damage has occurred during shipping).

#### NOTE

*Whenever the recorder is transported, be sure to relock the motor, or the capstan tire may be damaged beyond repair.*

Connect the power cord to the appropriate a-c power source.

Check the capstan speed with the stick-on strobosticker provided. Before checking, let the drive unit run for at least five minutes to warm up the lubricant in the capstan assembly. If the lubricant is stiff, additional drag will cause greater compression of the rubber tire and the capstan will run slower until warmed up. Place the strobosticker on the capstan shaft with the sticky side down and view the rotating shaft under a 60 cycle light. If the speed is not correct the spokes will appear to rotate. Slight speed changes can be adjusted by a change in the capstan drive motor pressure. This adjustment is at spring D, on the motor solenoid draw bar (see the illustration BOTTOM VIEW, TAPE TRANSPORT). If the adjustment is in the proper range, increasing pressure will slow the capstan, decreasing pressure will speed the capstan. Adjust for no rotation of the strobosticker spokes. (If the drive motor pressure is too light, increasing pressure will speed the capstan. In this range the tire pressure is inadequate for stable operation, and the pressure should be increased until an increase in pressure reduces the capstan speed.)

Thread the tape as shown in the appropriate tape threading illustration, making certain that the oxide-coated side will contact the heads.

Remove any adhesive material used to seal the end of the reel of tape to avoid breakage at the finish of rewind. Run new reels of tape through in fast forward for inspection.

## INTERCONNECTING

Refer to the appropriate interconnecting information at the back of this section.

## MOUNTING

Console equipment is shipped in a ready-to-operate condition. It is necessary only to connect the power cable to a convenient a-c source.

Equipment intended for rack mounting is designed to fit a standard 19-inch wide rack (see the illustration, TYPICAL RACK LAYOUT).

### NOTE

*A different Drive Motor return spring is used for console, portable and rack mount machines. Information on this may be found in Section 5 (TAPE TRANSPORT MECHANISM).*

## OUTPUT

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

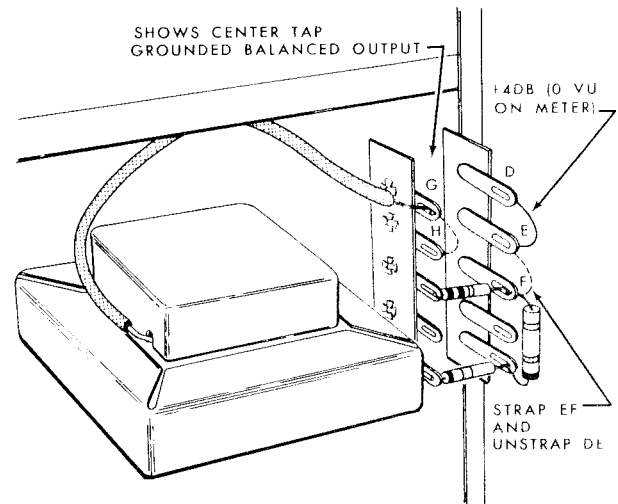
### Studio Line

Plus 8 vu, 600 ohm line output, balanced or unbalanced, is available across terminals 2 and 3 of the LINE OUT connector, J-5. 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.



### CENTER TAP GROUNDED BALANCED OUTPUT AND STRAPPING FOR +4 DBM EQUAL TO 0 VU ON THE METER

Plus 4 vu 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 7 ALIGNMENT AND PERFORMANCE CHECKS.

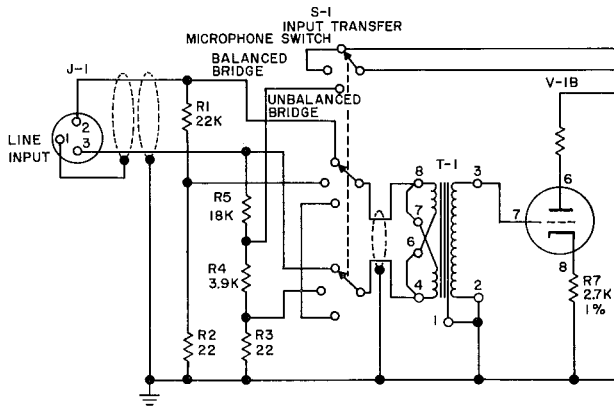
### High Impedance Amplifier Output

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

### 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.



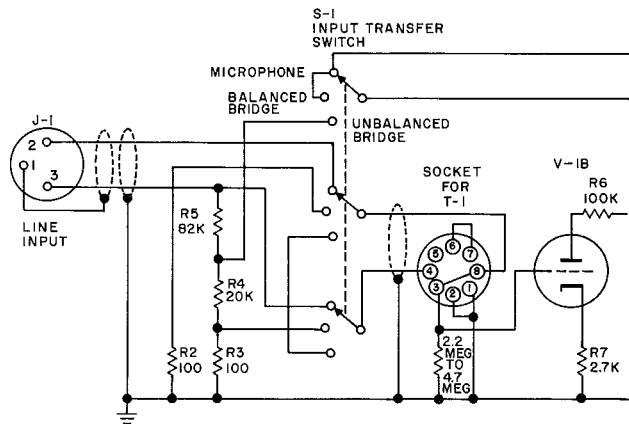
**MICROPHONES WITH 50 OHMS OR LESS IMPEDANCE**

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 in the illustration — 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 less than 50 ohms.

**IMPORTANT**

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

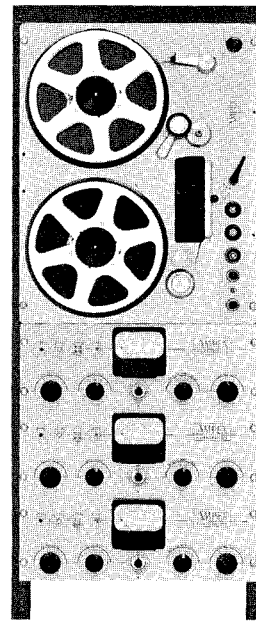
- R1—22K ohms      R3—22 ohms
- R2—22 ohms      R4—3.9K ohms
- R5—18K ohms



**HIGH IMPEDANCE MICROPHONE INPUT**

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 in the illustration—HIGH IMPEDANCE MICROPHONE INPUT.

- Step 1: Remove the input transformer T1.
- Step 2: Remove the 100,000 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.



**TYPICAL RACK LAYOUT**

- 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 -10 to +20 v-u can be accommodated. The load placed on the line is approximately 200,000 ohms.

### Bridging on 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 100,000 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 33,000 ohms and

R5 to 12,000 ohms. The resulting input impedances will be 66,000 ohms in the balanced bridge position and 30,000 ohms in the unbalanced bridge position.

An increase of 14 db unbalanced bridge gain without balanced bridge gain can be obtained by shorting out resistor R5 and changing R4 to 100,000 ohms. Resulting input impedance will be 50,000 ohms.

For a 10 db increase in balanced bridge gain without changing unbalanced bridge gain, change resistor R1 to 33,000 ohms, R5 to 27,000 ohms and R4 to 5,600 ohms. Resulting input impedances will be 66,000 ohms for balanced bridge and 33,000 ohms for unbalanced bridge.

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### SUMMARY

<i>For Gain Increase</i>	<i>Component</i>	<i>New Value</i>	<i>New Input Impedance</i>	
			<i>BAL BRIDGE</i>	<i>UNBAL BRIDGE</i>
10 db	R1	33,000 ohms	66,000 ohms	30,000 ohms
BAL BRIDGE and UNBAL BRIDGE	R5	12,000 ohms		
14 db	R5	zero (short out)	200,000 ohms	50,000 ohms
UNBAL BRIDGE	R4	100,000 ohms		
10 db	R1	33,000 ohms	66,000 ohms	33,000 ohms
BAL BRIDGE	R5	27,000 ohms		
	R4	5,600 ohms		

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### 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. The monitor jack J4 is a high impedance unbalanced output isolated from

the main line. To preserve low frequency response, feed into an input impedance 50K or higher. To preserve high frequency response the cable should have not over 500 uuf of capacitance.

### REMOTE CONTROL

Refer to the illustration—REMOTE CONTROL CIRCUIT (back of Section 5).

## 60 CYCLE AMPLIFIER:

(For precision drive motor power)

The Ampex Model 375 Precision 60 cycle amplifier can be plugged in directly at J805S. No other connections are necessary. If this unit is used with the recorder, the control circuits fuse must be increased by 5 amperes. Do not remove the dummy plug unless this unit is to be 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  
RESPONSE (Playback) NOISE  
MEASUREMENT  
RECORD CALIBRATION  
FREQUENCY RESPONSE  
RECORD NOISE MEASUREMENT

### NOTE

*It should be noted that this machine has been adjusted at the factory to produce frequency response within specifications when recording on an average tape. In the last few years the high frequency output from tape has improved tremendously. In order to keep pace with these improvements, in the summer of 1959 Ampex selected a new "average" tape to adjust bias and record equalization. Machines adjusted to the new average tape may be identified by the catalog number of the electronics, #30960 representing the revised machine.*

It is important to realign the equipment for each type of tape used.

Complete instructions for making the above checks are given in SECTION 7 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 reproducing. 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 near or below .1% rms at 30 inches, .1% rms at 15 inches, .2% rms at 7½ inch, and .25 rms at 3¾ 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 0 and 300 cycles per second (cps) expressed in percent rms.

## INTERCONNECTING

300-3, 300-4

The Models 300-3, 300-4 and all other multi-track equipment, not including the Sel-Sync units, are interconnected as illustrated except that the cable quantities are increased, the bias coupling from the second electronic assembly to the third, fourth and following electronic assemblies requires an adaptor Tee, catalog number 169-012, and a bias coupling cable, catalog number 14943-02, and different power interconnecting cables, the number of segments depending on the number of electronic assemblies. The Model 300-3, for instance, has three each reproduce, record and erase head cables, uses the bias adaptor TEE 169-012 and 2 bias coupling cables 14943-02 and power interconnecting cable 30851-01.

For those models in the 300 Series which are equipped with Sel-Sync, refer to the appropriate interconnecting information.

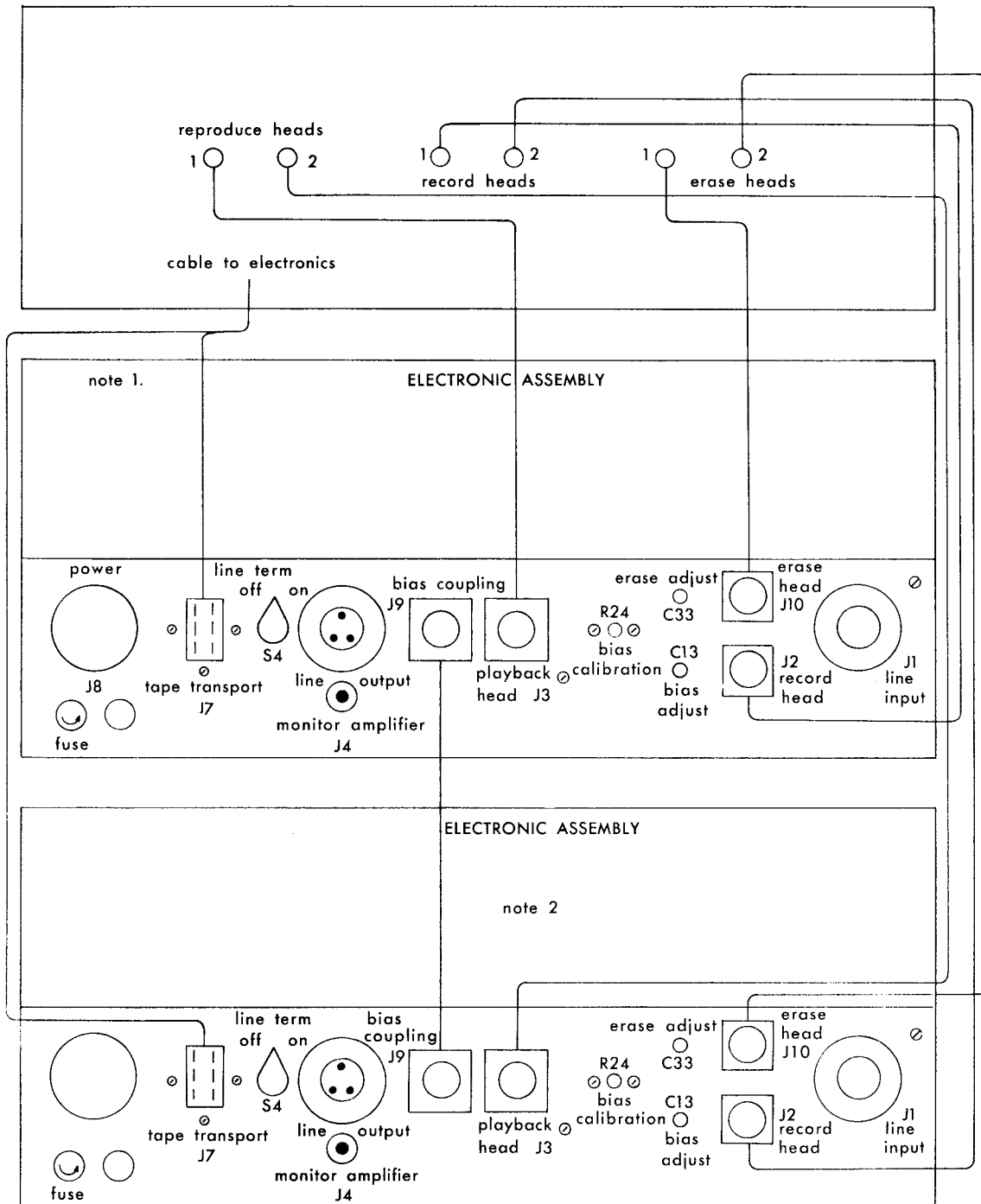
## INTERCONNECTING

### 300-2 and 300-2M

<i>Cable</i>	<i>Catalog Number</i>	<i>Qty.</i>	<i>From Receptacle</i>	<i>Chassis</i>	<i>To Receptacle</i>	<i>Chassis</i>
Reproduce Head	-----	(2)	Captive	Tape Transport	PLAYBACK HEAD, J3	Electronic Assemblies No. 1 and No. 2
Record Head	-----	(2)	Captive	Tape Transport	RECORD HEAD, J2	Electronic Assemblies No. 1 and No. 2
*Erase Head	-----	(2)	Captive	Tape Transport J7	TAPE TRANSPORT, J7	Electronic Assemblies No. 1 and No. 2
Power Interconnecting	30841-01	(1)	POWER CABLE TO ELECTRONICS	Tape Transport	TAPE TRANSPORT, J7	Electronic Assemblies No. 1 and No. 2
A-c Power	-----	(1)	117V LINE	Tape Transport		Convenient a-c Outlet
Bias Coupling	14943-02	(1)	BIAS COUPLING, J9	Electronic Assembly No. 1	BIAS COUPLING, J9	Electronic Assembly No. 2

\*The Model 300-2M has no erase head. Disregard the erase head connection.

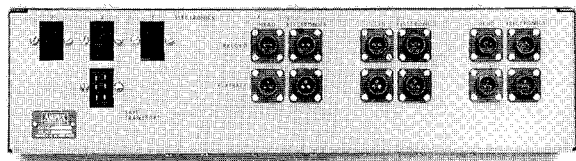
Note: Cables marked with a red band interconnect in upper electronics for 300-2 and 300-2M tape transports only. Cables marked TRACK 1, 2, 3 and 4 indicate interconnection of electronics from top to bottom of the 300-3 or 300-4 tape transport.



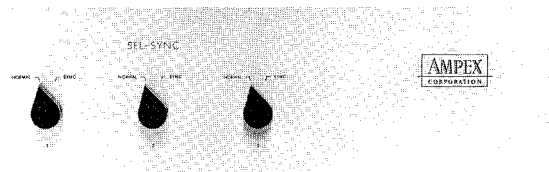
**NOTES:**

1. A 30841-01 power interconnecting "y" cable is used with dual track stereophonic and portable equipment.
2. A 14943-02 bias interconnecting cable is used with dual track stereophonic equipment.
3. Cables marked with a red band interconnect in upper electronics for 300-2 and 300-2M tape transports only. Cables marked track 1, 2, 3 and 4 indicate interconnection of electronics from top to bottom of the 300-3 or 300-4 tape transport.

**INTERCONNECTING  
300-2 AND 300-2M**



SEL-SYNC SWITCHING PANEL  
3 CHANNEL (BACK)



SEL-SYNC SWITCHING PANEL  
3 CHANNEL (FRONT)

**INTERCONNECTING**

300-3 1/2-inch Tape

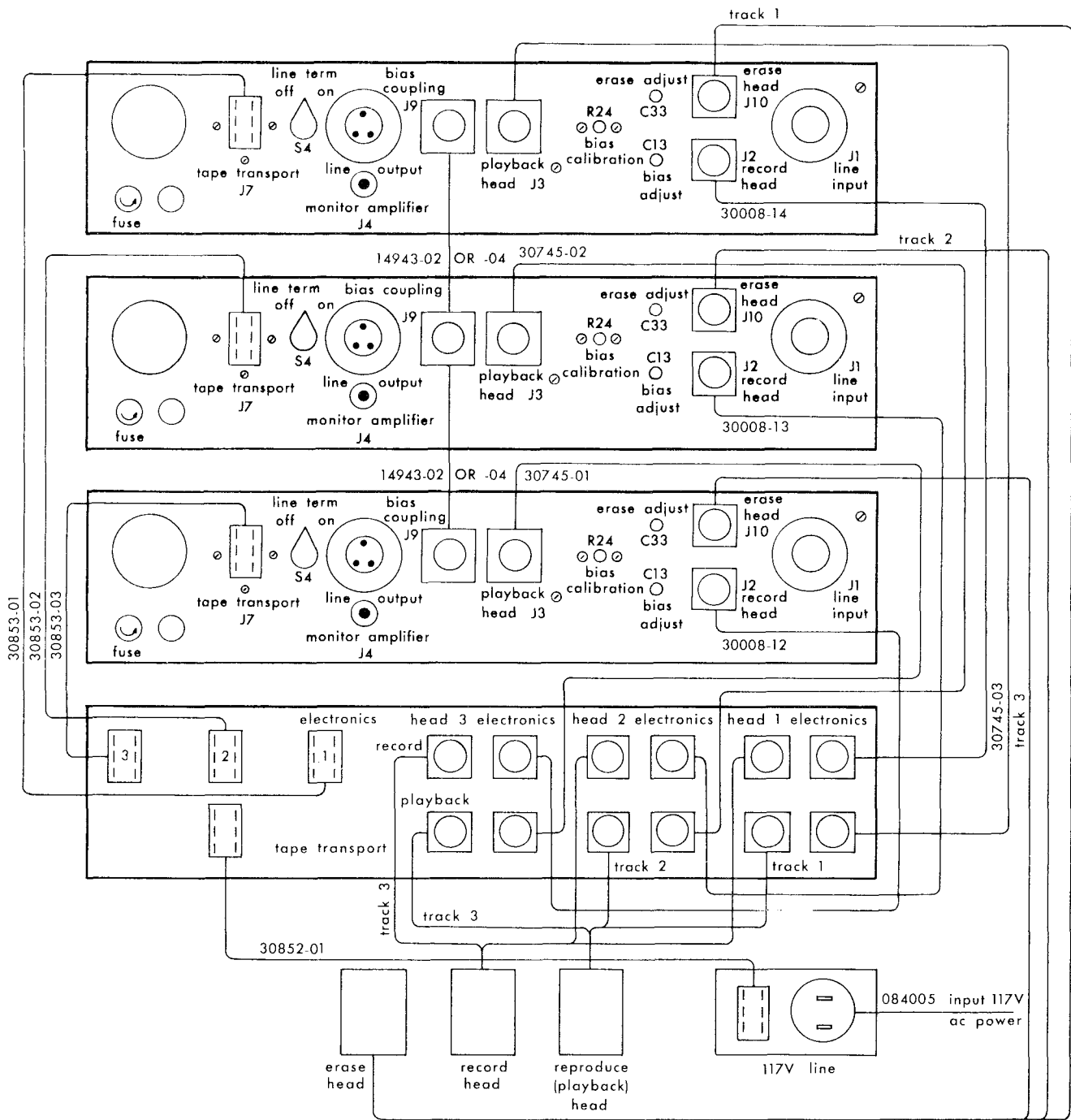
Separate Erase

Sel-Sync

<i>Cable</i>	<i>Catalog Number</i>	<i>Qty.</i>	<i>From Connector</i>	<i>Chassis</i>	<i>To Connector</i>	<i>Chassis</i>
A-C	084-005	(1)	117V LINE	Tape Transport Power Panel	A-C Source	Tape Transport
Power Extension	*30852-01	(1)	POWER CABLE TO ELECTRONICS	Tape Transport Power Panel	TAPE TRANSPORT	Sel-Sync
Bias Interconnecting	*14943-02	(2)	BIAS COUPLING, J9	Electronic Assembly	BIAS COUPLING, J9	Next Electronic Assembly
Power Interconnecting	*30853-01, 02 and 03	(3)	ELECTRONIC 1, 2 and 3	Sel-Sync	TAPE TRANSPORT J7	Electronic Assembly 1, 2 and 3
Playback Head	-----	(3)	Captive at Tape Transport		PB HEAD 1, 2 and 3	Sel-Sync
Record Head	-----	(3)	Captive at Tape Transport		RECORD HEAD 1, 2 and 3	Sel-Sync
Erase Head	-----	(3)	Captive at Tape Transport		ERASE HEAD J10	Electronic Assembly 1, 2 and 3
Playback Head Interconnecting	*30745-01, 02 and 03	(3)	PLAYBACK ELECT. 1, 2 and 3	Sel-Sync	PLAYBACK HEAD, J3	Electronic Assembly 1, 2 and 3
Record Head Interconnecting	*30008-12, 13 and 14	(3)	RECORD ELECT. 1, 2 and 3	Sel-Sync	RECORD HEAD J2	Electronic Assembly 1, 2 and 3

\*Dash numbers indicate length.





NOTES:

1. Cables marked Track 1, 2 and 3 indicate interconnection of the electronics from top to bottom, in conjunction with Erase, Record and Reproduce (Playback) Heads. All others are marked with part numbers and dash 1, 2 and 3 (designating length).

**INTERCONNECTING 300-3  
1/2-INCH TAPE SEPARATE ERASE  
SEL-SYNC**

## INTERCONNECTING

300-4 ½-inch Tape

Separate Erase

Sel-Sync

<i>Cable</i>	<i>Catalog Number</i>	<i>Qty.</i>	<i>Connector</i>	<i>From Chassis</i>	<i>Connector</i>	<i>To Chassis</i>
A-C	084-005	(1)	117V LINE	Tape Transport Power Panel	A-C Source	Tape Transport
Power Extension	*30852-01	(1)	POWER CABLE TO ELECTRONICS	Tape Transport Power Panel	TAPE TRANSPORT	Sel-Sync
Bias Interconnecting	*14943-02	(2)	BIAS COUPLING, J9	Electronic Assembly	BIAS COUPLING, J9	Between Electronic Assembly 1 and 2, 2 and 3
Bias Interconnecting	*14943-03	(1)	BIAS COUPLING, J9	Electronic Assembly	BIAS COUPLING, J9	Between Electronic Assembly 3 and 4
Power Interconnecting	*30853-08	(1)	ELECTRONICS NO. 1	Sel-Sync	TAPE TRANSPORT, J7	Electronic Assembly No. 1
Power Interconnecting	*30853-07	(1)	ELECTRONICS NO. 2	Sel-Sync	TAPE TRANSPORT, J7	Electronic Assembly No. 2
Power Interconnecting	*30853-06	(1)	ELECTRONICS NO. 3	Sel-Sync	TAPE TRANSPORT, J7	Electronic Assembly No. 3
Power Interconnecting	*30853-05	(1)	ELECTRONICS NO. 4	Sel-Sync		Electronic Assembly No. 4
Playback Head	TRACK 1, 2, 3 and 4	(4)		Captive at Tape Transport	PB HEAD TRACK 1, 2, 3 and 4	Sel-Sync
Record Head	TRACK 1, 2, 3 and 4	(4)		Captive at Tape Transport	RECORD HEAD TRACK 1, 2, 3 and 4	Sel-Sync
Erase Head	TRACK 1, 2, 3 and 4	(4)		Captive at Tape Transport	30825-06(07-08-09)	
Extension (Erase)	*30825-09	(1)		Connected to Erase Cable Track 1	ERASE HEAD J10	Electronic Assembly No. 1
Extension (Erase)	*30825-08	(1)		Connected to Erase Cable Track 2	ERASE HEAD J10	Electronic Assembly No. 2
Extension (Erase)	*30825-07	(1)		Connected to Erase Cable Track 3	ERASE HEAD J10	Electronic Assembly No. 3
Extension (Erase)	*30825-06	(1)		Connected to Erase Cable Track 4	ERASE HEAD J10	Electronic Assembly No. 4
Playback Head Interconnecting	*31069-05	(1)		Playback Electronics, No. 1	PLAYBACK HEAD, J3	Electronic Assembly No. 1
Playback Head Interconnecting	*31069-04	(1)		Playback Electronics, No. 2	PLAYBACK HEAD, J3	Electronic Assembly No. 2
Playback Head Interconnecting	*31069-03	(1)		Playback Electronics, No. 3	PLAYBACK HEAD, J3	Electronic Assembly No. 3
Playback Head Interconnecting	*31069-02	(1)		Playback Electronics, No. 4	PLAYBACK HEAD, J3	Electronic Assembly No. 4
Record Head Interconnecting	*31070-05	(1)		Record Electronics, No. 1	RECORD HEAD J2	Electronic Assembly No. 1

\*Dash numbers indicate length.

## INTERCONNECTING (Contd.)

300-4 1/2-inch Tape

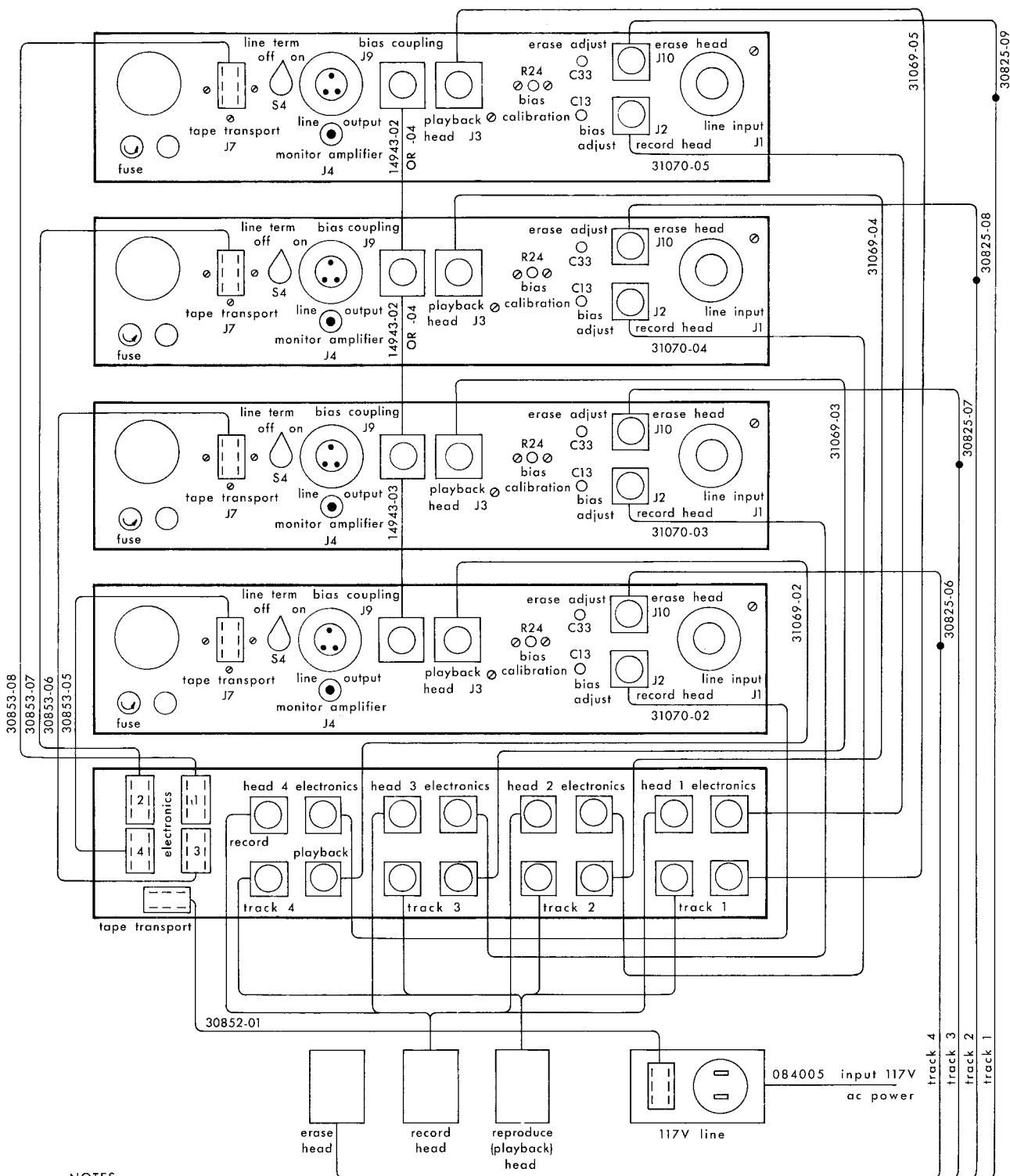
Separate Erase

Sel-Sync

<i>Cable</i>	<i>Catalog Number</i>	<i>Qty.</i>	<i>Connector</i>	<i>From Chassis</i>	<i>Connector</i>	<i>To Chassis</i>
Record Head Interconnecting	*31070-04	(1)	Record Electronics, No. 2	Sel-Sync	RECORD HEAD J2	Electronic Assembly No. 2
Record Head Interconnecting	*31070-03	(1)	Record Electronics, No. 3	Sel-Sync	RECORD HEAD J2	Electronic Assembly No. 3
Record Head Interconnecting	*31070-01	(1)	Record Electronics, No. 4	Sel-Sync	RECORD HEAD J2	Electronic Assembly No. 4

\*Dash numbers indicate length.

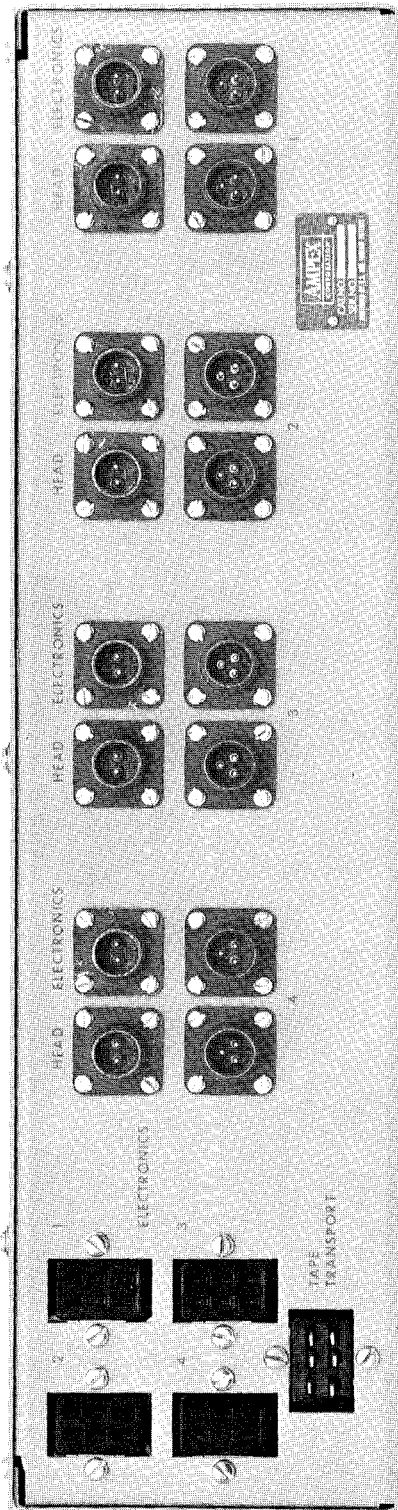
When ordering replacement parts always include the following information: Equipment Type; Equipment Serial Number; Ampex Part or Catalog Number; and Description of Part. DO NOT simply use the schematic reference number.



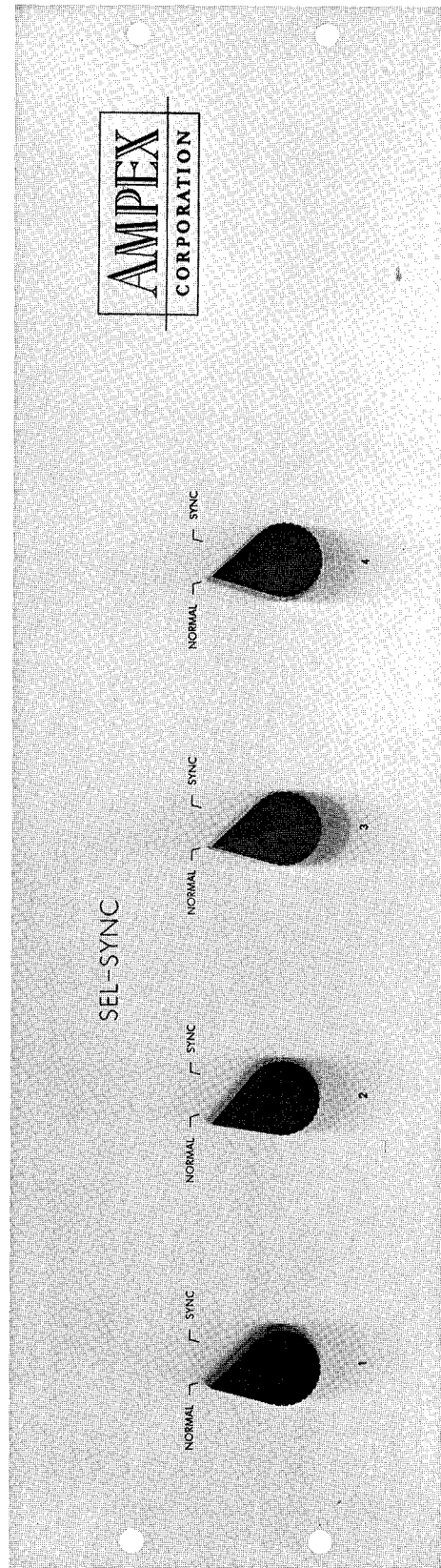
NOTES:

1. Cables marked track 1, 2, 3 and 4 indicate interconnection of the electronics from top to bottom, in conjunction with erase, record and reproduce (playback) heads. All others are marked with part numbers and dash 1, 2, 3 and 4 etc. (designating length).
2. Bias cables are used with an adaptor tee, catalog no. 169-012 coupling the electronics.

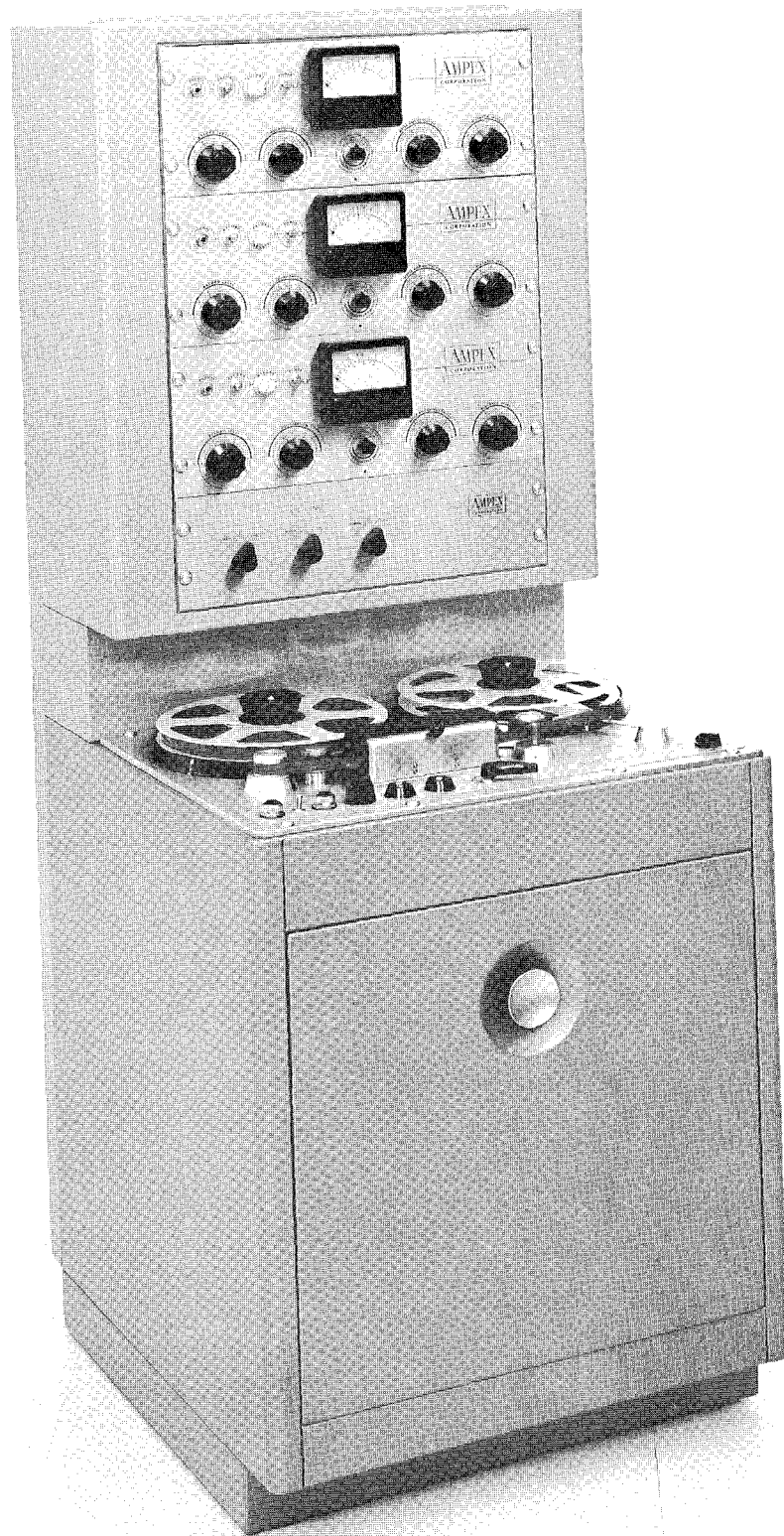
**INTERCONNECTING 300-4  
1/2-INCH TAPE SEPARATE ERASE  
SEL-SYNC**



SEL-SYNC SWITCHING PANEL 4 CHANNEL (BACK)



SEL-SYNC SWITCHING PANEL 4 CHANNEL (FRONT)



**MODEL 300-3, THREE TRACK  
RECORDER/REPRODUCER WITH SEL-SYNC**