AMPEX
CORPORATION
professional products division
934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

SERVICE BULLETIN

Date: 14, March 1960
Model: General
Bulletin No: Index
Page No: 1

New No.	Old No.	Date of Issue	Subject	Remarks 5/19
3-01	1	20 Jan. 1958	Gate Springs	✓
4-01	3	31 Aug. 1954	Replacing Heads	✓
5-01	4	25 Mar. 1955	Turntable Height	NO
5-02	5	18 Nov. 1959	Capstan Idler Adjustment	✓
	6	----------	Obsolete	
5-04	7	18 Nov. 1959	Tape Tensions	✓
6-01	8	12 July 1956	Head Cleaner	✓
	9	----------	Obsolete	
	10	----------	Obsolete	
6-02	11	6 Sept. 1956	Turntable Pin	✓
7-03	---	3 Feb. 1959	Dummy Erase	✓
8-01	12	3 Mar. 1958	Aligning Heads	✓
8-02	2	6 Mar. 1958	Hold Down Knob	✓
8-03	14	1 Aug. 1959	High Output Microphone	✓
8-04	13	19 Mar. 1958	Scales	✓
8-05	---	22 Dec. 1958	Signal-To-Noise	✓
8-06	15	16 Feb. 1959	Ampex Master Equalization (AME)	✓
9-01	---	14 May 1959	Torque Adjustment	NO
9-02	---	2 June 1959	VU Meter	✓
9-03	---	20 Oct. 1959	Brakes	✓
9-04	---	7 Dec. 1959	Drive Motor Springs	✓

AMPEX

FIELD ENGINEERING BULLETIN

VOLUME II PART 7
REFERENCE NUMBER 70110
SHEET NUMBER 1 of 2
MODEL NUMBER AG-300
DATE OF ISSUE 6-8-67
Distribution: 39-1, 39-2, 65-1, 62-7

TITLE ALTERNATE POWER INPUT CIRCUIT
PART NUMBER 4020251-04 REVISION

I APPLICIABILITY:

AG-300

II PURPOSE:

To prevent the possibility of erasure during certain modes of operation.

III DISCUSSION:

When operating in the Sel-sync mode the Rec-safe switch does not always prevent erasure of the tape.

IV PARTS REQUIRED:

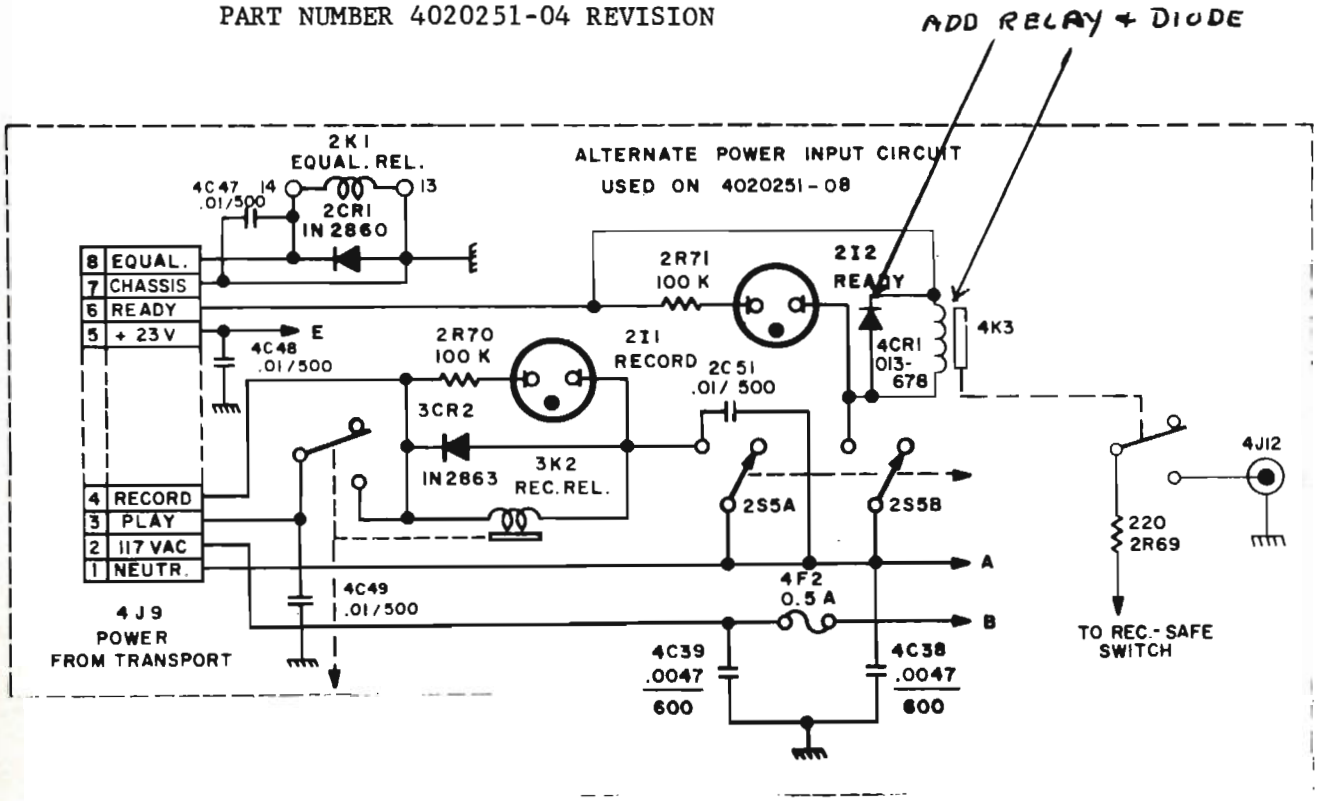
Item	Qty.	Ampex Part No.	Description
1	1		#12 Drill
2	1	4590050-01	Relay
3	1	475-079	Screw 6-32 x 5/16 in. long
4	1	013-678	Diode 1N4385

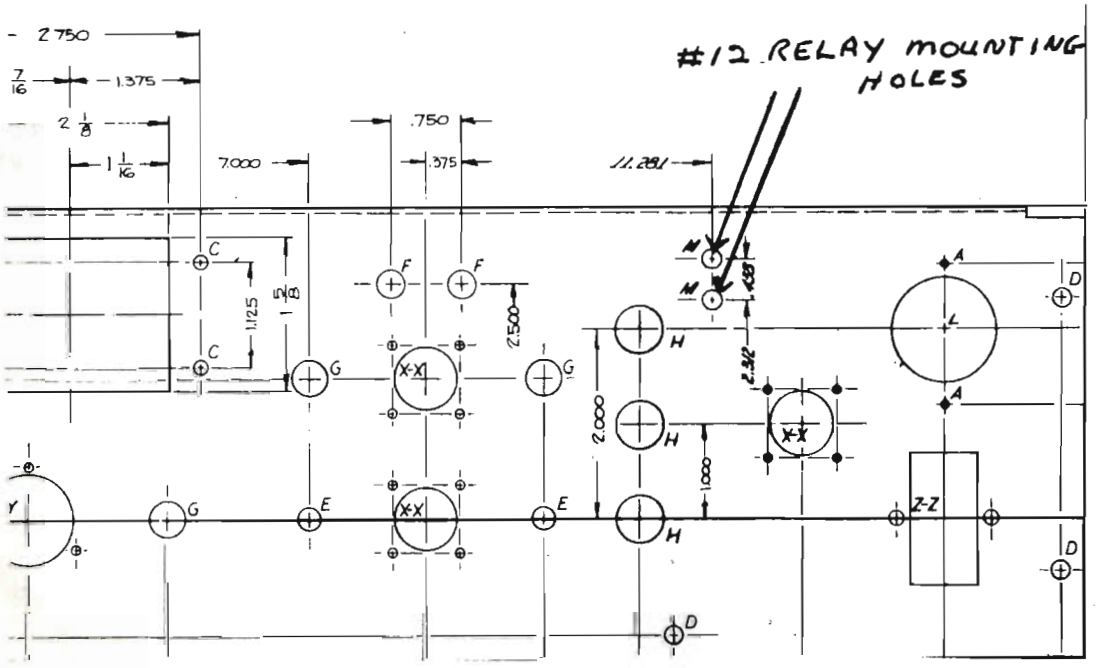
V PROCEDURE:

Remove the rear panel assembly and drill two holes located per the attached drawing. Mount the relay on the rear panel and connect the relay and diode in accordance with the attached schematic.

JB:vj

ALTERNATE POWER INPUT CIRCUIT
PART NUMBER 4020251-04 REVISION





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ELECTRIC CORPORATION
934 CHARTER ST. • EMERSON 8-1471
TWX REDWOOD CITY CAL 41
CABLE ADDRESS: AMPEX, REDWOOD CITY
REDWOOD CITY, CALIFORNIA

MAGNETIC RECORDERS

SERVICE BULLETIN

DATE: 31 August 1954
MODEL: General
BULLETIN NO: 3

REPLACEMENT HEAD PROCEDURE FOR AUDIO RECORDERS
Does not include Models 450 and 600

The following is an outline of the proper head alignment procedure which should be followed when a replacement head is installed on a tape transport.

1. Disconnect all head cables from the electronics.

2. Remove the two Allen cap screws from the under side of the tape transport and remove the head assembly from the tape transport. In the case of the Series 400 recorders, the head cover must first be removed since the hold down screws are located beneath the cover and hold the head base firmly against the tape transport.

3. Place the replacement head assembly on the tape transport and tighten the head assembly base to the tape transport by the use of the two Allen cap screws. The cover should be removed from the head assembly in every instance since it could bend the assembly if the assembly base is tightened down to the tape transport before removal of the cover. Reconnect cables to the electronic unit.

4. Carefully demagnetize the three heads with a head demagnetizer, (pointed out in Section 4.4.3 of the Model 350 manual). This and the following procedures are found in the various instruction manuals.

5. The playback alignment procedure should be followed next as pointed out in Section 5.6.3.

6. The erase, bias and record head adjustments are now made in accordance with Section 5.6.4.

Insert following IV P.6

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TWX REDWOOD CITY CAL 41
CABLE ADDRESS: AMPEX, REDWOOD CITY
REDWOOD CITY, CALIFORNIA

MAGNETIC RECORDERS

PROFESSIONAL PRODUCT

SERVICE BULLETIN

DATE: May 1, 1957
MODEL: General
BULLETIN NO: 10
PAGE NO: 1 of 1
(Supersedes bulletin dated October 25, 1956)

This bulletin is obsolete and replaced by the current issue of Model 300 Series Bulletin #6.

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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-1481 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

January 20, 1958
General
3-01
1 of 1

(Supersedes bulletin dated 20 March 1953)

INSTALLATION OF GATE SPRINGS IN 475 SERIES AND SIMILAR HEAD ASSEMBLIES

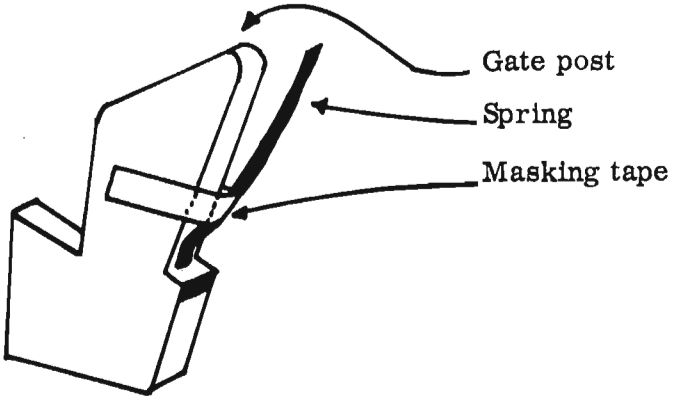
Should it be necessary to replace the 438-1 gate springs, the following method has proven to be the most practical:

1. Pull the drive pins at each end of the gate and remove the gate.

2. The springs are placed in the gate post with the crimped section in the slot as shown. They should be held in place with a small piece of masking tape. Be careful to keep the springs as straight as possible with reference to the gate post.

3. Push the gate assembly into place, in open position and insert the springs in the stop post slots during the process.

4. Insert the drive pins in the gate ends, leaving about 1/16" of the drive pins extending. Remove the masking tape.



Insert following IV, P. 6

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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

CAPSTAN IDLER PRESSURE ADJUSTMENT ON RECORDERS OF THE MODEL SERIES 300, 350, 400A & 450

The capstan idler is forced against the capstan by the action of the capstan solenoid. Idler pressure is supplied by the capstan idler pressure spring, and is adjusted by a lock nut on the capstan solenoid spade bolt. Tightening the lock nut increases idler pressure until a point is reached where the solenoid will not bottom. At this point, idler pressure drops to a value which is inadequate to permit the capstan to drive the tape, and slippage will occur unless the nut is backed off. Excessive pressure also throws an unnecessary load on the upper sleeve bearing of the drive motor. The recommended procedure for adjusting idler pressure is as follows:

Step 1: Hold the take-up tension arm so that the safety switch is de-activated.

Step 2: With the POWER switch in the ON position, press the PLAY button, and note whether the capstan solenoid is bottomed. (The capstan idler can be pushed off the capstan easily by pushing on the idler arm, if the solenoid is not bottomed). If necessary, back off the lock nut until the solenoid does bottom at 90 volts ac when cold, or 105 volts when warm (after 1/2 hour running). The pressure ("dig") against the capstan shaft should be approximately 5 pounds.

NOTE

In the course of normal operation in the reproduce or record modes, the temperature of the capstan solenoid will rise, and its dc resistance will increase. Therefore, the minimum line voltage required to bottom the solenoid when it is hot will be greater than that required when it is cold. If the equipment is operating on unusually low line voltage below (100 to 105v), sometimes encountered in areas where regulation is poor, the solenoid may fail to bottom after it has reached normal operating temperature. It is advisable, therefore, to allow the equipment to operate in the reproduce mode for about half an hour before making any necessary solenoid adjustments. This will allow the widest margin of safety with respect to line voltage variations. The solenoid is factory-adjusted to bottom at 90 line volts cold and and 105 line volts hot.

Step 3: If it is desired to measure capstan dig, press the STOP button at this point and select a piece of nylon lacing twine about 30 inches long and tie the ends together.

Step 4: Slip the twine loop just formed between the idler and idler arm so that the nylon rests against the idler shaft.

Step 5: Attach the other side of the loop to a 0 to 80 oz. scale, letting the nylon twine remain slack.

Step 6: Depress the PLAY pushbutton, causing the capstan idler to clamp against the capstan.

Step 7: Pull the scale away so that the nylon twine is taut and makes a 90 degrees angle with the idler arm.

Step 8: Now, slowly pull the scale away with sufficient power to cause the capstan idler to leave the capstan, reading the scale at the instant the capstan idler leaves the capstan. The scale reading should be 5 lbs. ± 8 oz. If necessary, adjust the capstan dig by increasing or decreasing the turns of the lock nut on the spade bolt.

In time, the capstan may become polished by the tape; thus allowing sufficient slippage to reduce the speed of the tape by as much as 1%. In lieu of factory sandblasting facilities, this slippage may be corrected by roughening the capstan with emery paper (Minnesota Mining and Manufacturing Company #320 grit or equivalent), so that the scratches lie parallel to the axis of the shaft. It is very easy to get a smooth, satiny roughness in this manner. However, care must be taken to prevent the particles of the emery paper from getting into the capstan bearing. It is recommended that the tape transport be placed so that the capstan shaft is parallel to the floor. The capstan shaft opening must be covered to prevent the emery particles from reaching the capstan bearing.

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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

Date: November 18, 1959
Model: General
Bulletin No: 5-04

TAPE TENSIONS ON AUDIO MACHINES

The following scale readings are made using a 10-1/2 inch NAB reel and line voltage at 117 volts:

Model 200

Rewind and takeup brake differential 32 and 16 oz.
Takeup tension 7 to 8 oz.
Holdback tension 6 to 8 oz.

Model 300	1/4"	1/2"	1"
Takeup and rewind brake differential	14 and 7 oz.	20 and 8 oz.	24 and 8 oz.
Takeup tension	6 to 7 oz.	7 to 9 oz.	8 to 10 oz.
Holdback tension	6 to 7 oz.	7 to 9 oz.	8 to 10 oz.
Capstan idler dig - all versions	5 lbs. minimum to 8 lbs. maximum		

Model 350 and 351

Rewind and takeup differential 14 and 7 oz.
Takeup tension 6 to 7-1/2 oz.
Holdback tension large reel 6 to 7-1/2 oz. Small reel 2 to 3 oz.
Capstan dig 5 lbs. ± 8 oz.

Model 400

Takeup and rewind brake differential 18 ± 2 oz. and 8 ± 2 oz.
Rewind and fast forward holdback 1-1/2 oz.
Takeup tension large reel 6 to 8 oz. Small reel 2 to 3 oz.
Holdback tension large reel 6 to 8 oz. Small reel 2 to 3 oz.
Capstan idler dig 5 lbs. ± 8 oz.

Model 400A

Takeup and rewind brake differential 18 ± 2 oz. and 8 ± 2 oz.
Rewind and fast forward holdback 1-1/2 oz.
Takeup tension 6 to 8 oz.
Holdback tension - not a constant - varies through constan tension arm brake and amount of tape on supply reel.
Capstan idler dig 5 lbs. ± 8 oz.

Model 450

Holdback tensions both turntables 6 to 8 oz.
Capstan idler dig 5 lbs. ± 8 oz.

Model 3200, Duplicator

Takeup and rewind brake differential 16 oz. and 8 oz.
* Takeup tensions large reel 6 to 8 oz. Small reel 2 to 4 oz.
* Holdback tensions large reel 6 to 8 oz. Small reel 2 to 4 oz.
Capstan idler dig 5 lbs. to 8 lbs. maximum.

Note: * Set tensions for best operating conditions of all sizes of reels.

Capstan idler dig is measured by connecting a loop of string around the shaft of the capstan idler and the other end of the string on a 5 or 10 lbs. spring scale. Place the machine in the play mode. Hold the spring scale so that the direction of pull makes an angle of 90° to the capstan idler arm. Slowly pull the scale away with sufficient power to cause the capstan idler to leave the capstan. The scale reading should be 5 lbs. ± 8 oz. at the instant the capstan idler leaves the capstan.

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934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-1481 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

September 6, 1956
General
6-02
1 of 1

TURNTABLE PIN

In recent months there have been a number of complaints of turntable pins shearing off under unusual operating conditions on some of the earlier versions of Models 300, 350 and S-3200.

While it is possible to replace these three small pins, a better solution is to install a single large pin, which is now available through all Authorized Service Representatives in Kit #17952-1 This Kit contains a Pin, a Nut and a Template.

To install the Pin, remove the Turntable Motor Assembly from the Tape Transport. Slide the Template over the motor shaft and mark the hole location lightly with a centerpunch at the point indicated by the cross (11/16" radius on the Turntable). Wrap a cloth around the motor to prevent drill chips from falling in. Drill a #28 hole to clear the 6-32 threads of the Pin.

The Pin should fit snugly against the Turntable. Therefore after drilling the hole it is necessary to enlarge the hole in the Pad to accommodate the 3/16" dia. Pin.

The Pin can then be inserted in the Turntable and held firmly with the 6-32 Nut provided.

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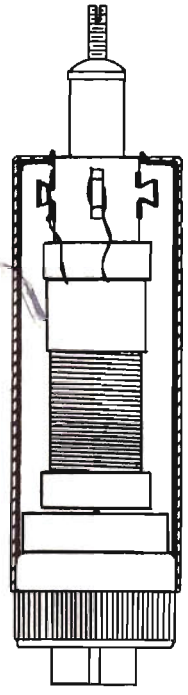
DUMMY ERASE UNIT

Under certain conditions operation without an erase head may be desired. In order to obtain proper bias current another inductor must be substituted for the erase head when it is removed. A suitable substitute may be constructed as follows:

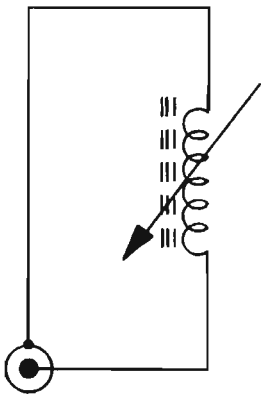


Cut off the plug above the screw holding the split halves. Mount the variable inductor on the cut off end of the connector. Connect one end of the inductor to the center conductor of the plug and the other end to the shell. Line the tube shield with insulating paper. Place the tube shield over the coil and press over the plug.

To adjust the recorder for use with the dummy erase, plug in all cables and operate in the record mode. Adjust the bias according to procedure outlined in maintenance manual. Note the VU meter reading in bias position if the recorder has this facility. Stop the recorder and remove the erase head connector from the electronics, and connect the dummy erase unit. Again place the machine in record mode. The bias is now set by adjusting the tuning slug in the dummy erase coil in place of the normal bias adjustment. Compare the VU meter reading in bias position with that obtained when the erase head was in use. The recorder may now be used with either erase head or the dummy erase with no further adjustments.

PARTS REQUIRED

Description	Ampex No.
1 - MS3106A-10S-2S, Connector	140-007
1 - 7 pin tube shield, 2-1/4" high	160-009
1 - Variable inductor, .44 - 3.1 mh	051-012



Electrical Schematic

AMPEX
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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-1481 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

March 3, 1958
General
8-01

METHOD OF ALIGNING HEADS WHEN STANDARD TAPE IS NOT AVAILABLE

I Misalign record head to definite right or left.

II Record section of tape at highest possible frequency consistent with reasonable level. Three-quarters (3/4) of a mil wave length at -10 VU is recommended. Approximately a three minute tone will be sufficient. (10 Kc at 7-1/2 ips is suggested)

III Rewind the recorded section and during this rewinding, insert an additional section of blank erased tape into the rewind reel with its oxide side toward the oxide side of original recorded section.

IV Disconnect erase head, turn record level to 0.

V Thread both tapes through the recorder simultaneously with shiny sides out (oxide to oxide).

VI Check to see that tapes are tracking through heads properly, then press record button. There is now bias only on the record head. The original recorded signal will be recorded as a mirror image on the second section. It will be at a somewhat lower level but will be recorded on this second section. Continue recording until inter-leaved section runs out.

VII Rewind original section only and splice the formerly inter-leaved section on the end.

VIII Play back the inter-leaved section and align playback head to this section. The alignment tool used should have a reference mark on its side. Mark the alignment point on the top of the head can and leave the tool at this point.

IX Play back the original section and again mark the alignment point.

X One half the difference between the two alignment points is the true perpendicular alignment. The two points should not be over one turn apart for greatest accuracy.

XI Set the playback head at the half difference point. This is now at true vertical azimuth and the record head may be aligned to playback head as in normal practice.

XII The entire process should be gone through two or three times if the utmost precision is desired. The final setting should be at the average of the trial settings.

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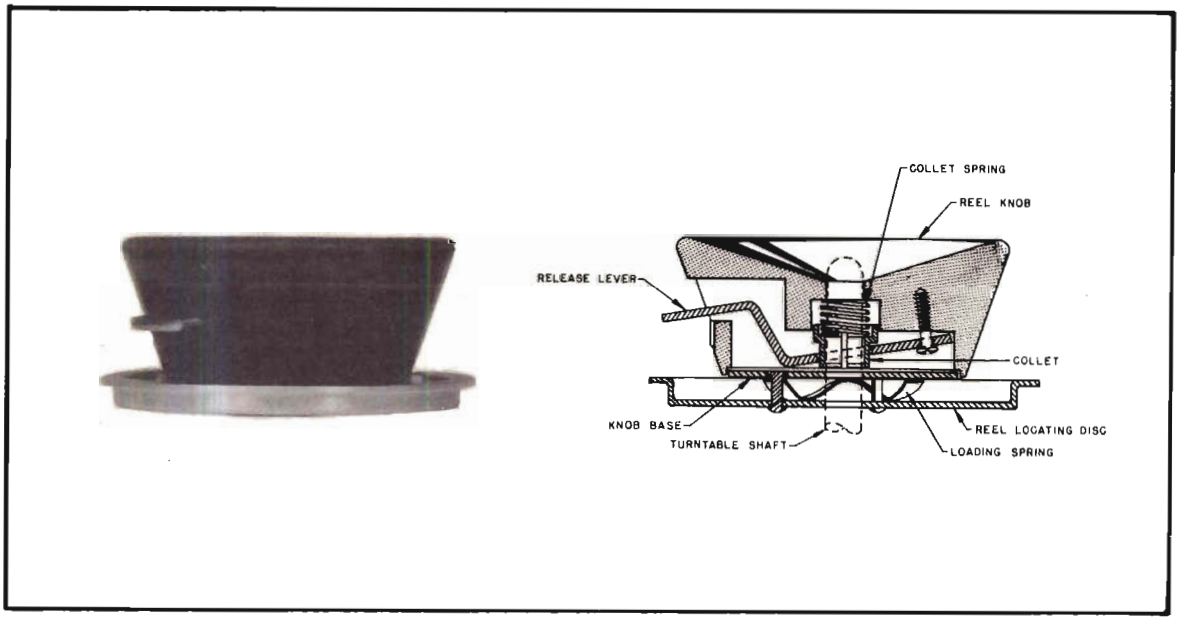
March 6, 1958
General
~~2~~ 8-02

#9093 REEL HOLD DOWN KNOB

All rack mounted Recorders require Hold Down Knobs on the turntable shafts to keep the reels from slipping off. For this purpose the #9093 Reel Hold Down Knob is supplied with rack mounted machines. This knob replaces the #4402 Knob.



The #9093 Knob has a simple, positive action. It is slipped on the turntable shaft with the concave side facing outward, and is pressed down firmly so that the reel locating disc is engaged in the center of the reel. A spring loaded collet within the knob engages the turntable shaft. The Knob is self-centering, as the knob base is mechanically coupled to the reel locating disc through a loading spring.

The Hold Down Knob must be taken off the shaft in order for the reels to be removed. To release the Knob, press the lever forward. This action releases the collet, and the Knob can then be pulled off the shaft. The reel should be held in position as the Knob is being removed, so that it will not slip off.

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SERVICE BULLETIN

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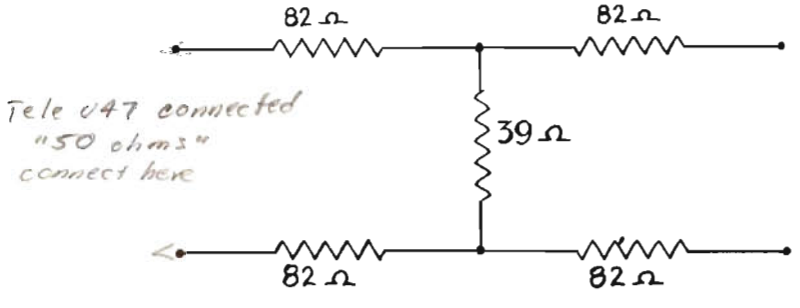
August 1, 1959
General
8-03
1

Use of High Output Microphones with Ampex Recorders

Certain microphones differ in operating characteristics from other microphones. The output level of some microphones is capable of sufficient level to cause distortion in the microphone amplifier stages of the Ampex Models 300, 350, 385 mixer, and Model 600/601 with low impedance kit. This difficulty can often be overcome by "padding down" the microphone output by 20 db or more.

A balanced "H" pad may be connected between the microphone output and the input of the Ampex. This pad may conveniently be installed in a small box which may be inserted in the microphone line. Diagrammed below is an "H" pad having output and input impedances of 200 ohms, and 20 db loss. Use half watt resistors.

Since the frequency response of some types of microphones may be adverely affected by terminating them, the distributor of the microphone in use should be contacted before using any type of loss pad.



AMPEX

SERVICE BULLETIN

AUDIO PRODUCTS DIVISION • AMPEX PROFESSIONAL PRODUCTS COMPANY

DATE March 19, 1958
MODEL General
BULLETIN NO. 8-04
PAGE NO. 1

SCALES FOR MEASURING TENSIONS AND BRAKES

Suitable scales for measuring tensions and brakes are available from the following:

JOHN CHATILLON & SONS
90 Cliff Street
New York City, N.Y.

Chatillon Part No.	Description	Approximate Price
8EG	0-8 oz., flat face	$ 2.65
16EG	0-16 oz., flat face	2.65
9EG	0-64 oz., flat face	2.65
015	0-80 oz., cylindrical	12.00

PELOUZE MFG. CO.
1218 Chicago Avenue
Evanston, Ill.

Pelouze Part No.	Description	Price
5T	0-80 oz., cylindrical	$ 10.00

THE EXACT WEIGHT CO.
917 W. Fifth Avenue
Columbus, Ohio

Postalett	0-8 oz.	(This scale is available at stationery suppliers)

For information regarding dealers, it is suggested these companies be contacted.

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RECORD SIGNAL-TO-NOISE

For some time, many users of tape recorders have been under the erroneous impression that a gain in signal-to-noise ratio may be obtained by disconnecting the erase head.

The following data were taken as a substantiation to our refutation of this rumor about disconnecting erase heads:

SETUP:

AMPEX Model 350, 1/4" full-track recorder.
IRISH "300" Shamrock tape operating at peak bias, 1000c, 15 ips.
NAB equalization.

NOISE MEASURING EQUIPMENT:

Flat: Hewlett-Packard Model 400-D, VTVM preceded by SKL filter, set for 20 c to 20 kc.
Weighted: Using network similar to ASA, "A" response for sound level meters.

REFERENCE FOR NOISE MEASUREMENT:

Operating level section of 15 ips standard tape 4494-A2.

Model: General
Bulletin No. ~~18~~ 8-05
December 22, 1958

		Flat		Weighted	
		7-1/2 ips	15 ips	7-1/2 ips	15 ips
1.	Amplifier, only	-62 db	-62 db	-76 db	-76 db
2.	Bulk erased tape	-61	-61	-68	-67
3.	Bulk erased tape run over erase and record heads	-60	-58	-63	-61
4.	Bulk erased tape run over record head only	-60	-58	-63	-61
5.	Bulk erased tape run over erase head only	-60	-58	-63-1/2	-62

Note: In line 4, data are the same for unplugging the erase head or for lifting the tape from the erase head.

We see that for either response or speed the bulk erased tape run over erase and record heads (Line 3) is noisier than the bulk erased tape only (Line 2). However, the bulk erased tape run over the record head only (Line 4) is just as noisy as, or noisier than, the bulk erased tape run over the erase head only (Line 5). This shows that the additional noise is introduced by the bias in the record head and NOT by the erase head. We can therefore conclude that there is no reason whatsoever for disconnecting the erase heads in a Model 350 recorder, or, since operating parameters are similar, any Ampex recorder.

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934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

Date: 2 June 1959

Service Bulletin: 9-02

Model: General

VU METER REPLACEMENT

The mounting studs of the 4" VU meter formerly carried as Ampex catalog number 090-002 have been moved inward slightly to lessen possibility of breakage. This revised mounting meter is carried as Ampex catalog number 30667-01. It is now supplied in lieu of the 090-002, since the latter is no longer available.

To use the 30667-01 on older models, it is necessary to drill four new 3/16" diameter holes in the meter panel using the template supplied with the meter as a guide.

It is recommended that the panels be removed from the electronics chassis for drilling or other precautions taken to assure that no metal chips enter the electronics chassis.

SERVICE BULLETIN

AMPEX

AUDIO PRODUCTS DIVISION • AMPEX PROFESSIONAL PRODUCTS COMPANY

DATE October 20, 1959
MODEL General
BULLETIN NO. 9-03

BRAKES, BRAKE BAND REPLACEMENT AND TENSION ADJUSTMENTS

Part I - Old Brake Assembly

Two different designs of Brake Assemblies have been used on the Model 300 and Model 350 Series Recorders. The earlier design, which was discontinued on production models of the 300 Series and 3200 Series during 1956 and the 350 Series on August 1, 1959, is shown in Figure I.

This design used graphited felt brake bands and one brake tension spring which is adjustable to maintain proper brake tension settings.

After long usage, the graphited-felt brake lining will begin to glaze, and the brakes may exhibit some tendency to grab. This condition may be relieved by periodic readjustment of brake tensions and the cleaning of the brake drum.

The brake drum may show some spots of material on its surface which are normal and of no great harm to the function of the brakes. These deposits of material on the drum are particles of graphite and dust gathered by the static charge developed by the rotating drum. Clean the surface with solvent or, if necessary, with #240 grit sandpaper.

Brake linings may be reconditioned in place by the following procedure: Mix one level tablespoon of graphite with 8 ozs. of carbon tetrachloride. Apply to the brake linings with an oil can. (Be sure the can is free of all traces of oil). After re-graphiting, the turntable motors should be run for ten minutes with the brakes on in order to wear in the graphite. This can be accomplished either by disconnecting the brake solenoids temporarily, or by removing one of the clevis pins in the brake linkage to prevent the brakes from being released when the solenoids are energized.

If the brake linings are too badly worn to respond to this reconditioning procedure or if the brake band is broken, it is necessary to replace the brake band assemblies which are available in sets of two. Order Kit #7970-01.

REMOVAL PROCEDURE

The following procedure for removal and installation of the brake band assembly should be done with care. Slight misadjustment of the band when installing could cause future breakage and excessive wear.

Removal of the complete torque motor assembly from the tape transport is sometimes necessary or desired depending on the accessibility to the brake housing assembly into which the brake band is to be installed.

Step 1: With a 7/16" socket wrench remove the four mounting screws and washers at the motor mounting plate, carefully holding the motor with one hand to prevent it from falling. The turntable will remain attached to the motor assembly.

Step 2: Take the motor to a convenient work area.

Step 3: Unhook the brake tension spring from the brake lever.

Step 4: Remove the two screws holding the motor capacitor to the solenoid bracket. (On some models the capacitor is mounted on the side of the motor which makes this step unnecessary). Let capacitor hang free of housing. Replace one of the screws temporarily to keep the solenoid bracket tight on the housing for future adjustments.

Step 5: Remove the screws that hold the brake housing to the motor, noting the positioning of the housing, washers, and spacers, and remove the entire housing.

Step 6: Remove the two socket-head screws that hold the brake band to the housing at Point "A". Note that three clamping elements are involved: The clamp, and two spring-steel leaves.

Step 7: Loosen, do not remove, the two screws that hold the other end of the brake band to the #330 link by inserting a socket-head screw key (i.e., an Allen wrench) between the two brake solenoid links. The old brake band can now be removed from the link and brake housing.

INSTALLATION PROCEDURE

Before installing the new brake band, it should be pressed flat between two boards in a vise in order to compress the felt lining. If this is not done, the lining will be too thick to permit free rotation of the brake drum after installation, and will result in dragging brakes and improper brake differential. Once the band is installed, the felt will no longer swell, as it does relatively quickly when the bands are not bent in their normal curve.

The new band should be handled carefully. Contact with the felt lining and fingers should be kept to a minimum as the natural oil from the skin will affect the friction characteristics of the prepared felt surface.

The spring steel band should be free of any foreign material on the side opposite the felt lining. Wiping the spring steel with a soft cloth impregnated with a non-oil base solvent should be sufficient to remove any foreign material.

It is also a good procedure to clean the inside of the brake housing and the brake drum surface (note fourth paragraph, page 1) with a non-oil base solvent before installing the new band.

Step A: Slide the new brake band assembly into the opening on the side of the housing. Follow the curvature of the housing, making sure the band is not kinked at any time.

Step B: Slide band far enough around the inside of the housing so that slotted end of band can be slipped back into the #330 link. Tighten one Allen screw at the link to keep band in place until later adjustment is made.

Step C: Line up opposite end of band with holes at Point "A". Connect band, following the sequence shown in the drawing. The two leaves are intended to relieve all possible strain on the band at this point. Tighten Allen screws to the #329 clamp, making sure the edges of the band, band leaves and clamp are even.

Step D: Push the solenoid plunger down by hand until it bottoms in the solenoid. Loosen the Allen screw in the #330 link and adjust the depth of insertion of the slotted brake band between the link and clamp so that the band will be expanded firmly and evenly against the inner wall of the housing. Tighten Allen screws.

CAUTION: If the band is set too far forward in the link, it will buckle slightly when the solenoid plunger is bottomed. If this condition continued to exist, the spring steel band would eventually break at the point of buckling.

Step E: Remount the brake housing assembly on the motor. (Be sure to install the spacers).

Step F: Reinstall brake tension spring.

Step G: Push the solenoid plunger down by hand until it bottoms; then release, noting the distance the plunger returns due to the tension spring. The distance the solenoid plunger travels is directly proportional to the clearance between the brake band felt and the brake drum when the solenoid plunger is bottomed in the solenoid.

The clearance between the brake band felt and brake drum when the solenoid plunger is bottomed can be adjusted to a minimum by moving the brake housing assembly slightly on the motor mounting studs in the direction desired. This can be accomplished by tapping lightly on the base of the brake housing with a plastic hammer.

The best conditions exist for long life of the band when the plunger travel and brake band clearance is kept to a minimum. This results in less movement of the brake band at Point "A" and less tendency for the brake band to buckle at the #330 link.

Step H: Remount capacitor to bracket, if previously removed. (Be sure the smaller of the two screws goes into the solenoid assembly).

Step I: Remount torque motor assembly to transport.

Step J: Run the brakes in for ten minutes, as described in the reconditioning procedure, before adjusting brake tensions.

Part II

The new brake assembly shown in Figure II is currently used on production Models 300, duplicator and 351 series recorders.

This design uses a Raybestos brake band with two adjustment points to maintain proper brake tension settings. To replace the older brake assemblies with the newer version simply order by Ampex catalog number below:

TAPE WIDTH	ASSEMBLY	CATALOG NO.
1/4 inch	Takeup	17327-1
1/4 inch	Rewind	17327-2
1/2 inch	Takeup	17327-3
1/2 inch	Rewind	17327-4
1 inch	Takeup	17327-5
1 inch	Rewind	17327-6

The assembly is shipped from the factory with all adjustments set for correct performance.

In the course of wear in normal service, or in the event of brake band failure, readjustments and replacement of the brake band may be necessary.

Periodic readjustments of brake tensions, after long usage, is necessary to maintain proper brake tensions. If brake tensions cannot be maintained, it may be necessary to recondition the bands in the following procedure: Remove the brake housing assembly in the same manner called out in the brake band replacement. Clean the brake drum surface with a non oil base solvent. Clean the Raybestos brake band surface by sanding lightly with a #240 grit sandpaper. Replace the brake housing assembly and adjust tensions.

If the brake linings are too badly worn to respond to this reconditioning procedure or if the band is broken, it is necessary to replace the brake band assemblies which are available in sets of two. Order #17612-01.

RAYBESTOS BRAKE BAND REPLACEMENT

Removal of the complete torque motor assembly from the tape transport is sometimes necessary or desired depending on the accessibility to the brake housing assembly into which the brake band is to be installed.

Brake bands may be replaced without removing motor from tape transport on rackmount machines and deleting the first two steps.

Step 1: With a 7/16 socket wrench remove the four mounting screws and washers at the motor mounting plate, carefully holding the motor with one hand to prevent it from falling.

Step 2: Take motor to a convenient work area.

Step 3: Unhook the brake tension spring from the brake lever.

Step 4: Remove the two screws holding the capacitor to the solenoid bracket. (On some models the capacitor is mounted on the side of the motor which makes this step unnecessary). Let capacitor hang free of brake housing. Replace one of the screws temporarily to keep the solenoid bracket tight on the housing.

Step 5: Disconnect the solenoid wires at knife disconnects.

Step 6: Remove the screws that hold the brake housing to the motor, noting the position of the washers and spacers and remove the entire housing.

Step 7: Loosen (do not remove) the two cap screws at the end of the brake band next to the solenoid. (Point A).

Step 8: Remove the two cap screws (at Point B) holding one end of the brake band between the brake lever spring and the housing using a 5/16" Allen wrench.

Step 9: The brake band may now be removed taking caution not to lose the band leaf on the solenoid side. There is only one band leaf per assembly.

Before installing the new brake band, clean the inside of the brake housing and the brake drum surface with a non-oil base solvent.

Step 10: Position the new brake band through the hole in the housing. Follow the curvature of the housing and place between the clamp and link at Point B. Replace the two cap screws and tighten.

Step 11: Insert the other end of the band between the band link and clamp at Point A, making certain that small band leaf is also positioned at this point on inside of band next to the clamp. Do not tighten the two cap screws at this time.

Step 12: Replace the brake housing assembly on the motor, making certain that the spacers, housing, lock washers and the screws are replaced in that order and tighten the screws.

Step 13: Push the solenoid plunger in by hand until it bottoms. Adjust the depth of insertion of the brake band between the link and clamp at Point A so that there is no buckling of the band and so that the brake drum rotates freely with no drag. Then tighten the two cap screws.

CAUTION: If the band is set too far forward in the link it will buckle when the solenoid plunger is bottomed by hand. If this condition continued to exist the band would eventually break at the point of buckling.

Step 14: Interconnect the wires at the knife disconnects and replace the capacitor to the bracket with the two screws removed in Step 4.

Step 15: Hook the brake spring to the brake lever.

Step 16: Replace the motor assembly, if removed in Step 1, tightening the four screws securely.

Step 17: Run the torque motors for approximately ten minutes. Energize and de-energize the brake solenoid several times to seat the brake bands against the drums.

Step 18: Adjust the brake tensions to the correct settings as called for in "Brake tension adjustments".

BRAKE TENSION ADJUSTMENT

Smooth brake operation is of primary importance in maintaining proper tape tension while stopping the tape. Since the hold-back tension, supplied by the trailing turntable motor torque, is lost as soon as the Stop button is pressed, the maintenance of tape tension then becomes a function of brake operation. The fundamental design consideration in the brake system is that the braking force acting on the turntable from which the tape is being pulled (the trailing turntable) in any of the modes of operation must always exceed the braking force acting on the turntable taking up the tape (the leading turntable) in order to prevent the throwing of tape loops.

Brake tension is adjusted with no power applied to the machine. Note that the old style brakes, Figure I, have only one spring tension adjustment which is for the high side. The low side tension is a ratio of the high side setting. On the new style brake assembly, Figure II, there are two adjustment points. One for the high side tension and one for the low side tension. The procedure is, as follows:

A. Place an empty 10-1/2 inch NARTB reel on the tape supply turntable.

B. Tie a loop at each end of a piece of string about thirty inches long.

C. Attach one loop to the tape anchor on the reel hub. Wind the string on by turning the reel clockwise by hand.

D. Attach the loop in the free end of the string to a 0-32 oz. spring scale, and pull. (The turntable will rotate counterclockwise). Take a reading only when the turntable is in steady motion, as the force required to overcome the static friction will produce an excessively high initial reading.

E. Adjust the brakes for scale readings listed below.

F. Now wind the string on the hub by rotating the reel counterclockwise: pull, and take a reading. (The turntable will rotate clockwise.) The reading should be approximately as listed below.

G. Repeat the entire process on the takeup turntable. Note that the direction of most resistance is opposite that of the supply turntable.

If small EIA reels or hubs only are used, the brakes will not necessarily stop without some slack forming when fast winding onto the small reel or hub. This is because with normal brake settings, the inertia of the reel that is taking up the tape serves to tension the tape, and if the brakes are set tight enough to stop a small reel without slack, the tension on the tape will be excessive when using the regular reel.

SPRING SCALE READING

Tape Width	Direction of Most Resistance Supply Counterclockwise Takeup Clockwise	Direction of Least Resistance Supply Clockwise Takeup Counterclockwise
1/4 inch	15 to 16 ounces	2:1 ratio ± 1 ounce in accordance with the High Side
1/2 inch	19 to 20 ounces	2.5:1 ratio ± ounce, etc.
1 inch	22 to 24 ounces	3:1 ratio ± ounce, etc.

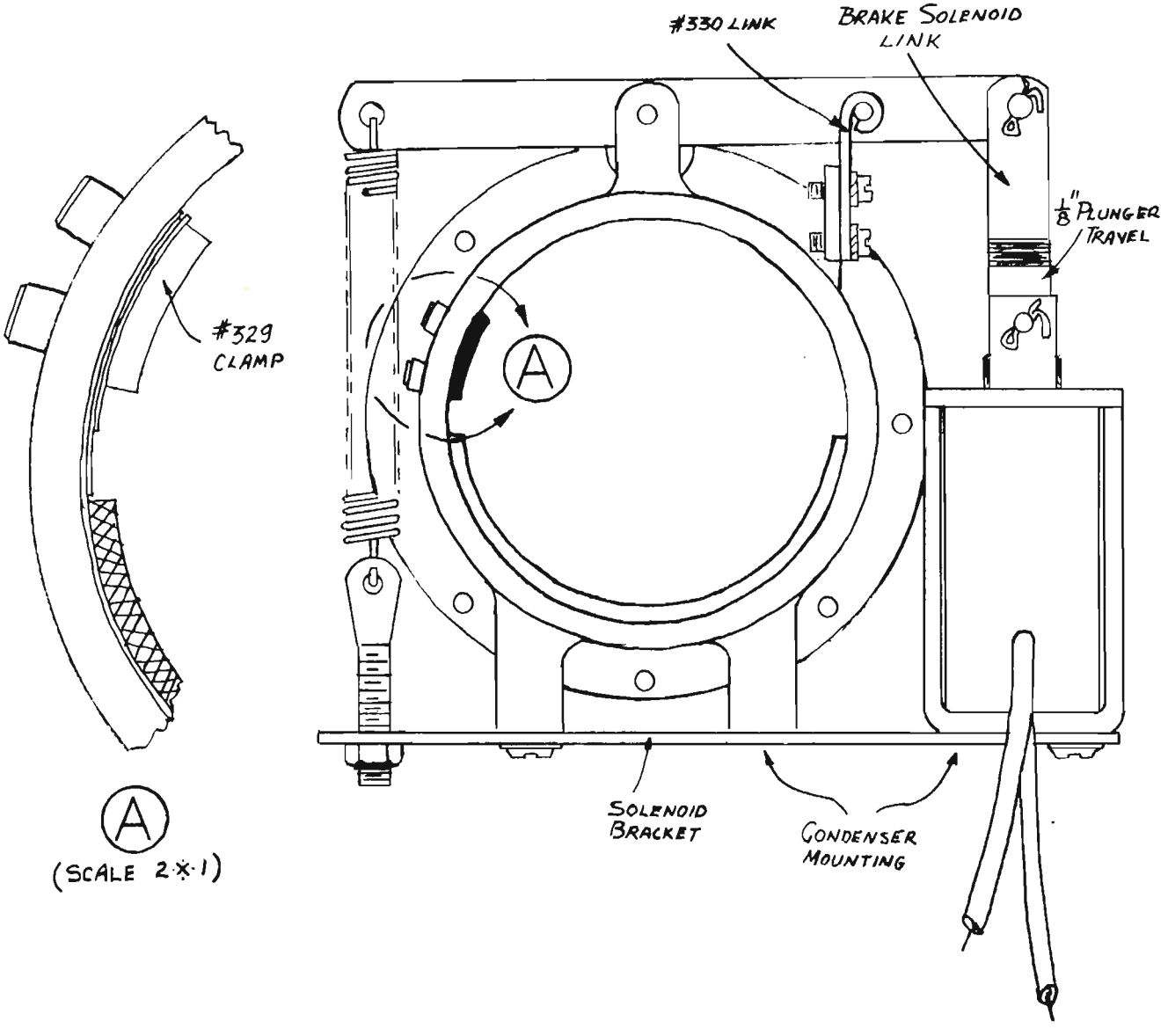
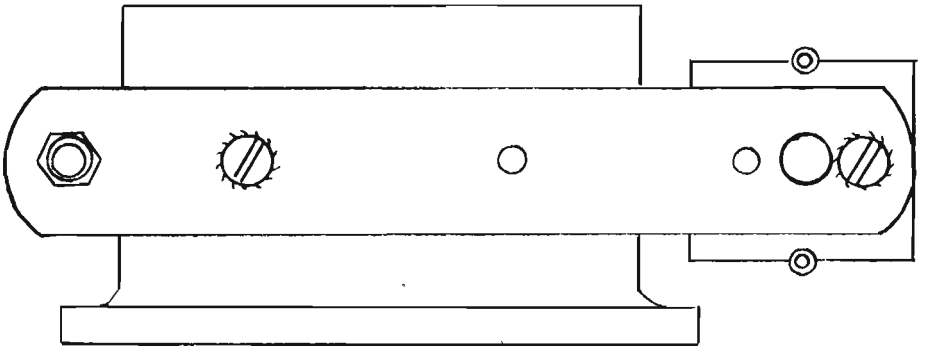

#330 LINK
BRAKE SOLENOID LINK
1/8" PLUNGER TRAVEL
#329 CLAMP
A
A
(SCALE 2:1)
SOLENOID BRACKET
CONDENSER MOUNTING

FIG. 1



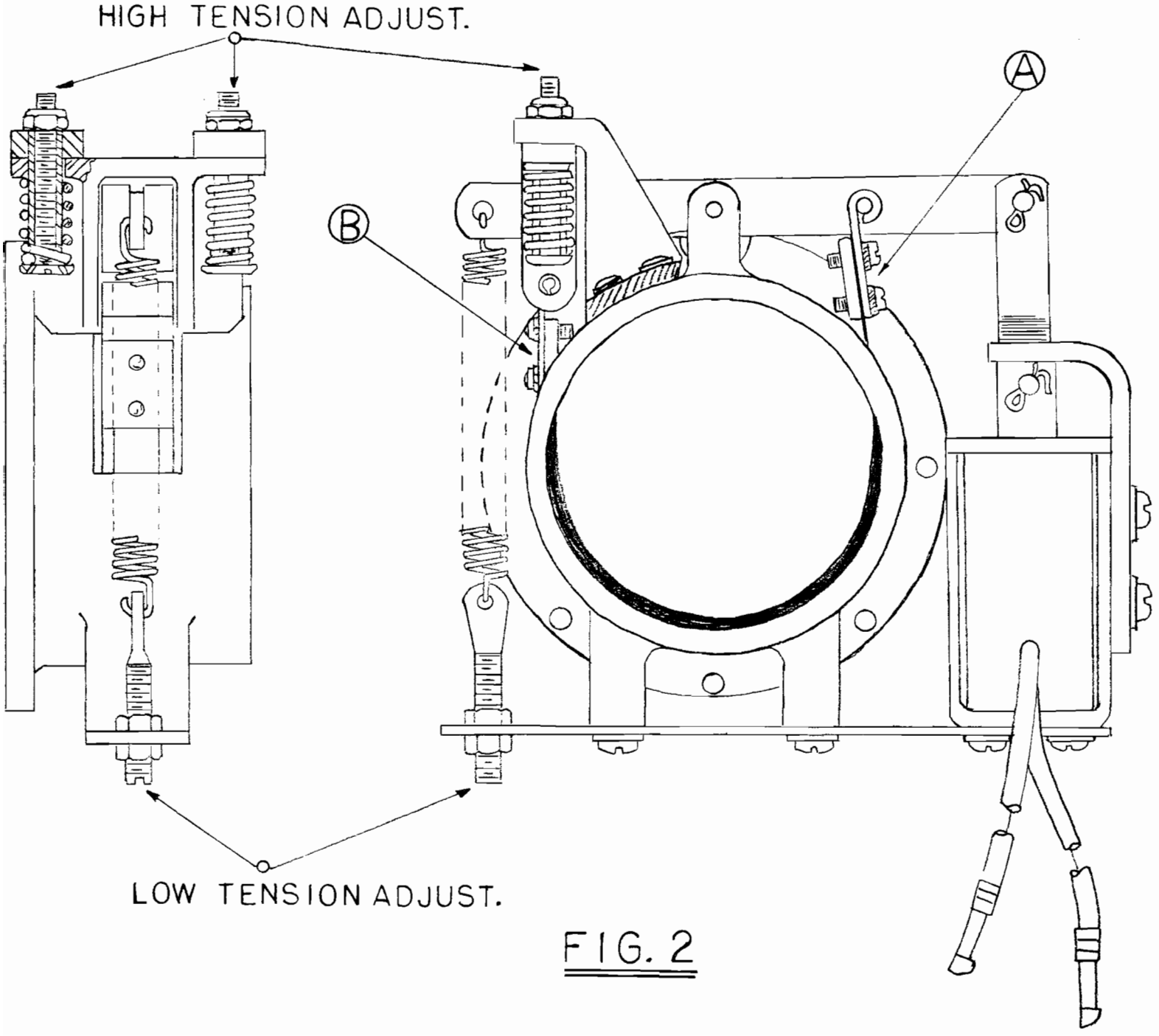


FIG. 2

AMPEX
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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

MODEL 300 AND DUPLICATOR DRIVE MOTOR RETURN SPRINGS

With the introduction of the new type drive motor return spring bracket arm, part #19997-01 and #19998-01 on the 7990 drive motor assembly in February 1958, it was necessary to also change the drive motor return springs for rack and console mounted transports.

The drive motor return springs used on all Model 300 transports and duplicators since February 1958 are, as follows:

Catalog #19995-01	For rack mounted transports
Catalog #19994-01	Console mounted transports

The drive motor return springs previously used on Model 300 and duplicator transports prior to February 1958 are as follows:

Catalog #16215	Rack mounted 50 cycle transports
Catalog #7814	Rack mounted 60 cycle transports
Catalog #1024	All console mounted transports

The above springs are not interchangeable as a replacement spare part.

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SERVICE BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-7111 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

Date: 9 December 1959
Model: General
Bulletin No.: 9-05

TURNTABLE MOTOR ASSEMBLY

A review of turntable motor assemblies indicates that it is possible and desirable to standardize the turntable motor assembly, catalog number 6768-00, for direct replacement on all Model 300, 3200, 3300, 350 and 351 series transports.

The 6768-00 turntable motor assembly is now a direct replacement for the following previously listed turntable motor assemblies.

Model	Obsolete Spare Assembly
300	2458-00; 6768-01; 6768-02
3200/3300	2458-00; 6768-01; 6768-02
350/351	7558-00 and 6768-01

The 6768-00 assembly is provided complete with motor, brake drum, turntable, mounting flange and capacitor.

AMPEX

FIELD ENGINEERING BULLETIN

VOLUME II PART	7
REFERENCE NUMBER	70112
SHEET NUMBER	1 of 1
MODEL NUMBER	General
DATE OF ISSUE	5-31-67

TITLE PROPER SOLVENT FOR CLEANING HEAD ASSEMBLIES

All Professional Audio Products

I APPLICIABILITY:

All Professional Audio Products.

II PURPOSE:

To prevent damage to head assemblies.

III DISCUSSION:

Recent complaint of early head failure resulted in an investigation that indicates some customers are using a solution to clean heads that is causing the epoxy to break down. This causes the heads to wear at an abnormal rate.

IV PARTS REQUIRED:

Head Cleaner Ampex Part Number 087-007.

V PROCEDURE:

The above head cleaner is recommended for use on all Professional Audio Recorders.

NOTE: Using any solvent except Xylene may result in damage to head assemblies.

JB:vj

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MARKETING DEPARTMENT BULLETIN

934 CHARTER ST. · REDWOOD CITY, CALIF. · EMERSON 9-1481 · TWX REDWOOD CITY, CAL 41 · CABLE ADDRESS: AMPEX, REDWOOD CITY

July 7, 1958

TO: PROFESSIONAL AUDIO DEALERS

SUBJECT: AMPEX STANDARD ALIGNMENT TAPES

Catalog No.	Description	List Price
4494	Standard and Alignment Tape. 15 ips - frequencies voice announced. Frequencies in order of occurrence: 15,000 cps for azimuth alignment, 250 cps at zero VU, 250 cps at -10 VU (standard test level), 15,000 cps, 12,000 cps, 10,000 cps, 7,500 cps, 5,000 cps, 2,500 cps, 1,000 cps, 400 cps, 200 cps, 100 cps, 50 cps, and voiced instructions for adjustment.	$14.50 ea.
5563	Standard and Alignment Tape. 7-1/2 ips - frequencies voice announced. Frequencies in order of occurrence: 10,000 cps for azimuth alignment, 250 cps at zero VU, 250 cps at -10 VU (standard test level), 10,000 cps, 7,500 cps, 5,000 cps, 2,500 cps, 1,000 cps, 400 cps, 200 cps, 100 cps, 50 cps, and voiced instructions for adjustment.	$14.50 ea.
6000	Standard and Alignment Tape 3-3/4 ips - frequencies voice announced. Frequencies in order of occurrence: 7,500 cps for azimuth alignment, 250 cps at -10 VU (standard test level), 50 cps, 100 cps, 200 cps, 400 cps, 700 cps, 1,000 cps, 2,000 cps, 4,000 cps, 6,000 cps, 7,500 cps, 250 cps at zero VU.	$14.50 ea.
6874	Standard and Alignment Tape and Bias Check. 3-3/4 ips - frequencies voice announced. Frequencies in order of occurrence: 7,500 cps for azimuth alignment, 7,500 cps, 6,000 cps, 4,000 cps, 2,000 cps, 1,000 cps, 500 cps, 100 cps, 50 cps, 250 cps at zero VU. In addition, provides approximately 40 feet of stable "Mylar" base tape selected for "centerline" performance for bias adjustment.	$14.50 ea.

NOTE: Approximate duration of tones on all Standard and Alignment Tapes are:

Azimuth Alignment:	40 seconds
Level Set:	30 seconds
Frequency Response Check:	15 seconds