AMPEX
MODEL 375

OPERATION AND MAINTENANCE MANUAL
INSTRUCTION MANUAL
FOR
MODEL 375  60 CYCLE AMPLIFIER

The Ampex Model 375 Amplifier is a 60 cycle oscillator and power amplifier designed to supply a constant frequency from unstable power sources. It will deliver 70 watts of 60 cycle power when fed from a power source having frequency from 50 to 400 cycles.

The Model 375 is composed of two component sections, a precision tuning fork controlled 60 cycle oscillator and a power amplifier, either of which may be used independently. The tuning fork oscillator supplies a 7 volt 60 cycle output (500,000 ohm unbalanced) with a frequency accuracy of 5 parts per million per degree centigrade.

The power amplifier will deliver full power over a range from 50 to 75 cycles when fed from an external signal generator. The frequency range may be extended to 400 cycles by changing one capacitor. See operation.

SPECIFICATIONS

Output Power: 70 Watts
Output Frequency: 60 c.p.s., when using tuning fork oscillator 50 to 400 c.p.s., when using external signal generator.
Output Voltage: 0 to 130 Volts, continuously variable.
Input Power Source: 117 volts, 50 to 400 c.p.s., 275 watts.
Dimensions: Built to mount on standard 19 inch relay rack. Occupies 12-1/4 inches of rack space.
Weight: 60 pounds.
Front Panel Controls:

1. Output voltage control R2311
2. Output voltmeter M2301
3. Output transfer switch, S2301, which allows the load to be fed either through the amplifier or directly from the power line.
4. Indicator lamp, A2301, indicates when power is supplied to the amplifier.
5. Stroboscope supply socket, J2303S, which provides a source of power for a two watt neon lamp.
6. Power Amplifier input jack, J2301, which allows connecting an external signal source to the power amplifier.
7. Fuses for protection of the amplifier.
INSTALLATION

Both power input and power output connections of the Model 375 Amplifier are made with a single eight pin connector J2302P. Pins 1 and 4 are the power line input connections, and Pins 5 and 8 are the amplifier output connections. A four #18 wire cable is required between the 60 cycle amplifier and the tape recorder.

The six pin receptacle J2304S contains the output connections of the tuning fork circuit and the input connections to the power amplifier. Dummy plug #2414 should be inserted in this receptacle except when the Model 375 is used with Model 381 Speed Lock Equipment.

INSTALLATION WITH MODEL 300, 301 AND 302 RECORDERs

Input and output connections are made to terminal strip TS-501 mounted on the capstan motor support bracket underneath the Model 300 top plate. In order to accommodate the additional load the two 5 ampere line fuses on the Model 300 Recorder should be increased to 8 amperes.

CONNECTIONS FOR MODEL 300 RECORDER - Serial 1 thru 500.

(1) Remove the strap between Terminals 4 and 5 on TS-501 and move the drive motor solenoid lead from Terminal 4 to Terminal 5.
(2) Pin 1 of the Model 375 connects to Terminal 3 of TS-501.
(3) Pins 4 and 5 of the Model 375 connect through separate wires to Terminal 1 of TS-501. It is necessary to run separate leads as the common impedance of a single lead will cause unnecessary hunting of the capstan drive motor.
(4) Pin 8 of the Model 375 connects to Terminal 5 of TS-501.

CONNECTIONS FOR MODEL 300 RECORDERs - Serial 501 and up.

(1) Remove the strap between Terminals 4 and 5 on TS-501.
(2) Pin 1 of the Model 375 connects to Terminal 4 of TS-501.
(3) Pins 4 and 5 of the Model 375 connect through separate wires to Terminal 1 of TS-501. It is necessary to run separate leads as the common impedance of a single lead will cause unnecessary hunting of the capstan drive motor.
(4) Pin 8 of the Model 375 connects to Terminal 5 of TS-501.
(5) For Recorders using a Bodine Drive Motor (Serial Numbers 600 and up) it is necessary to connect the power factor correction condenser C2319 across the Model 375 output. To do this strap Pin 7 to Pin 5 on the eight pin power connector J2302P.
(6) A slight time interval from 8 to 15 seconds must be observed while the Model 375 warms up.

INSTALLATION WITH MODEL 306 AND 307 RECORDERs

Connections from the Model 375 are made at connector J-805S located on MODEL 375 Page 2
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on the connector panel underneath the top plate. A four #18 wire cable is required, connecting terminals 1, 4, 5, and 8 of the two plugs. In order to accommodate the additional load the two 5 ampere line fuses on the 307 must be increased to 8 amperes. Strap pin 7 to pin 5 on power connector J23023 to connect the power factor correction condenser across the output.

OPERATION

After making the necessary connections, place the output transfer switch in the Amplifier position. This supplies power to the amplifier and connects the load to the amplifier. Adjust the output voltage control for the desired voltage as read on the voltmeter. When supplying power to Ampex Tape Recorders, it is recommended that the voltage be adjusted to 110 volts. Higher voltages will produce excess current drain in the amplifier, decreasing the life of the 807 vacuum tubes. NOTE: The voltage should be adjusted under load conditions only. If the load is removed, the voltage will rise above 150 volts and pin the meter. This will in no way damage the meter as no load voltage is far less than the overload rating of the meter.

To extend the frequency range of the power amplifier above 75 cycles, it is necessary to reduce the value of the Condenser C2313 to approximately .025 microfarads.

ADJUSTMENTS

The following adjustments have been made at the factory prior to shipment. Further adjustments are unnecessary except as required in routine maintenance.

1. OUTPUT TUBE BIAS ADJUSTMENT. The bias on the 807 output tubes V2306 and V2307 should be adjusted to -30 Volts by an adjustable tap on Resistor R2322 (located underneath chassis).

2. TUNING FORK OSCILLATOR LEVEL. The Tuning Fork Oscillator level is determined by the bias on the Diode Limiter V2303. Connect a vacuum tube voltmeter to Pin 5 of V2303 and chassis ground. Adjust the appropriate tap on Resistor R2322 to provide -1 1/2 Volts bias.

3. B+ VOLTAGE ADJUSTMENT. Two VR tubes (V2308, V2309) are used to regulate the B+ supply voltage for all plates except those of the output tubes. The variable resistor R2317 determines the operating point of the VR tubes. This resistor is factory-set to provide adequate regulation for any load at line voltages between 117 and 127 volts. If the Model 375 is operated at line voltages below 117 volts, the VR tubes may cease to regulate. This will not affect performance except at the point where the VR tubes exhibit a tendency to flicker. This condition, reflected as a small periodic swing on the output meter, may be corrected by changing the load voltage, or by reducing the resistance of R2317. IMPORTANT: If R2317 is readjusted to compensate for low line voltage, any appreciable rise in line voltage may overload the VR tubes.
INSTALLATION OF MODEL 375 AMPLIFIER
WITH MODEL 400 AND 401 RECORDERS

60 CYCLE AMPLIFIER CONNECTOR

1. INPUT
2. OUTPUT

1. Disconnect the two wires from the swinger of the motor speed switch S-302. This switch has two swingers, but only one has two wires connected to it. Connect these two wires to a line leading to Pin 1 of the Model 375 input-output connector J2302P.
2. Connect Pin 8 of the Model 375 to this swinger.
3. Refer to Fig. 3 of the 400 or 401 Instruction Book. Connect Pins 4 and 5 of the Model 375 through separate leads to the top plate power switch S301. There are two terminals on S301, the correct one being the terminal that connects to plug S-305P where the cable to the electronics connects. This terminal can be identified by tracing continuity from J-305P to the switch with the switch in the "off" position.
4. It is necessary to increase the size of the top plate fuse F-102 to 5 amperes.
5. The power factor correction capacitor, C-2319, in the 60 cycle amplifier is not necessary with the Model 400 or 401.
6. The output voltage of the 60 cycle amplifier should be adjusted to 110 volts. Setting up higher voltages will produce excessive current drain in the amplifier.
III. 60 Cycles, Amplifier - Catalog 201

A2301 6-0 V. Panel Lamp - Bayonet Base
Red Pilot Lamp Base
G2301 .5 FFD 600 V. Tubular Condenser
G2302 1.0 FFD 600 V. Tubular Condenser
G2303 50 FFD 25 V. Electrolytic Condenser
G2304 .1 FFD 600 V. Tubular Condenser
G2305 10 FFD 650 V. Electrolytic Condenser
G2306 .1 FFD 600 V. Tubular Condenser
G2307 50 FFD 25 V. Electrolytic Condenser
G2308 1.0 FFD 400 V. Tubular Condenser
G2309 3.75 FFD 320 V. AC Condenser
G2311 10 FFD 450 V. Electrolytic Condenser
G2312 .1 FFD 600 V. Tubular Condenser
G2313 .25 FFD 600 V. Tubular Condenser
G2314 10 FFD 450 V. Electrolytic Condenser
G2315 50 FFD 25 V. Electrolytic Condenser
G2316 50 FFD 50 V. Electrolytic Condenser
G2317 100 FFD 50 V. Electrolytic Condenser
G2318 15 FFD 1,000 V. Oil Condenser
G2319 7.5 FFD 340 V. AC Condenser
G2320 .05 FFD 600 V. Tubular Condenser
G2321 25 FFD 25 V. Electrolytic Condenser
G2322 50 FFD 150 V. Electrolytic Condenser
G2323 20-20-20-20 FFD 150 V. Electrolytic Condenser
G2324 20-20-20-20 FFD 50 V. Electrolytic Condenser
G2325 80 FFD 150 V. Electrolytic Condenser
F2301 3.2 Ampere S10-Ato Fuse
J2301S Input Jack - Closed Circuit
J2302P Power Connector - Jones P-308-AB
J2303S Strobe Connector - Jones S-302-AB
J2304S Signal Connector - Jones S-305-AB
L2301 2 Henry Toroidal Inductance
L2302 Swinging Filter Choke - 5 to 25 Henry
F2301 AC Voltmeter
R2301 2 00 Ohm 1 Watt Composition Resistor
R2302 1 Megohm 1 Watt Composition Resistor
R2303 100,000 Ohm 1 Watt Composition Resistor
R2304 10,000 Ohm 1 Watt Composition Resistor
R2305 1 Megohm 1 Watt Composition Resistor
R2306 680 Ohm 1 Watt Composition Resistor
R2307 25,000 Ohm 10 Watt Wire Wound Resistor

NOTES: ORDER PARTS BY PART LIST AND NUMBER OR X1

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Voltage Control Knob
Condenser Insulating Washer
Cable Assembly
MODEL 375 AMPLIFIER

It has been brought to our attention that with the 60 cycle amplifier connected to 300 series recorders as recommended in 60 cycle amplifier instruction book, scuffing of the capstan tire results. This is caused because the motor pulley comes in contact with the capstan tire while the motor is running.

This can be corrected by changing the connection of Pin 1 of the 60 cycle amplifier from Terminal 3 on the capstan motor terminal strip as originally recommended, to Terminal 4 on this terminal strip.

When this is done a slight time lag (from 8 to 15 seconds) should be observed after the tape is threaded to allow the 60 cycle amplifier to warm up.
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