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 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 J2302P 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

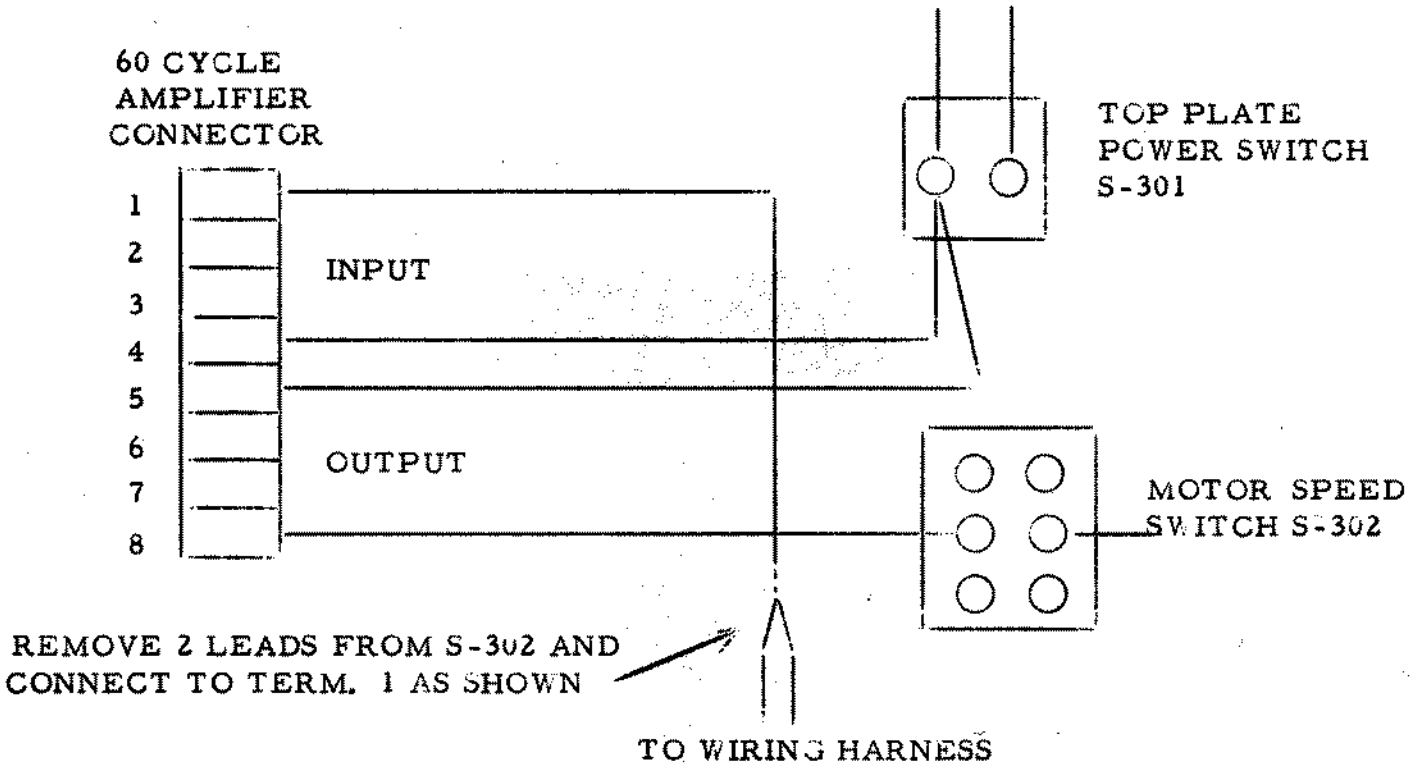
The following adjustments have been made at the factory prior to shipment. Further adjustments are unnecessary except as required in routine maintenance.

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



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.

Schematic Reference Number	Description	Ampex Catalog Number
	III. 60 CYCLE AMPLIFIER - Catalog #841	
A2301	6-8 V. Panel Lamp - Bayonet Base	LA-2
	Red Pilot Lamp Base	DL-3
C2301	.5 MFD 600 V. Tubular Condenser	CO-36
C2302	1.0 MFD 400 V. Tubular Condenser	CO-37
C2303	50 MFD 25 V. Electrolytic Condenser	CO-60
C2304	.1 MFD 600 V. Tubular Condenser	CO-33
C2305	10 MFD 450 V. Electrolytic Condenser	CO-55
C2306	.1 MFD 600 V. Tubular Condenser	CO-33
C2307	50 MFD 25 V. Electrolytic Condenser	CO-60
C2308	1.0 MFD 400 V. Tubular Condenser	CO-37
C2309	3.75 MFD 330 V. AC Condenser	CO-84
C2311	10 MFD 450 V. Electrolytic Condenser	CO-55
C2312	.1 MFD 600 V. Tubular Condenser	CO-33
C2313	.25 MFD 600 V. Tubular Condenser	CO-35
C2314	10 MFD 450 V. Electrolytic Condenser	CO-55
C2315	50 MFD 25 V. Electrolytic Condenser	CO-60
C2316	50 MFD 25 V. Electrolytic Condenser	CO-60
C2317	100 MFD 50 V. Electrolytic Condenser	CO-63
C2318	15 MFD 1,000 V. Oil Condenser	CO-51
C2319	7.5 MFD 330 V. AC Condenser	CO-85
C2320	.05 MFD 600 V. Tubular Condenser	CO-32
C2321	25 MFD 25 V. Electrolytic Condenser	CO-59
C2322	80 MFD 150 V. Electrolytic Condenser	CO-105
C2323	20-20-20-20 MFD 450 V. Electrolytic Condenser	CO-65
C2324	20-20-20-20 MFD 450 V. Electrolytic Condenser	CO-65
C2325	80 MFD 150 V. Electrolytic Condenser	CO-105
F2301	3.2 Ampere Slo-Blo Fuse	FU-8
J2301S	Input Jack - Closed Circuit	JA-1
J2302P	Power Connector - Jones P-308-AB	PL-8P
J2303S	Strobo Connector - Jones S-302-AB	PL-75S
J2304S	Signal Connector - Jones S-306-AB	PL-55S
L2301	2 Henry Torroidal Inductance	CH-7
L2302	Swinging Filter Choke - 5 to 25 Henry	CH-18
M2301	AC Voltmeter	ME-1
R2301	2200 Ohm 1 Watt Composition Resistor	RE-7
R2302	1 Megohm 1 Watt Composition Resistor	RE-2
R2303	100,000 Ohm 1 Watt Composition Resistor	RE-20
R2304	10,000 Ohm 1 Watt Composition Resistor	RE-15
R2305	1 Megohm 1 Watt Composition Resistor	RE-32
R2306	680 Ohm 1 Watt Composition Resistor	RE-36
R2307	25,000 Ohm 10 Watt Wire Wound Resistor	RE-95

NOTE: ORDER PARTS BY AMPEX CATALOG NUMBER ONLY!

Schematic Reference Number	Description	Ampex Catalog Number
R2308	10,000 ohm 10 Watt Wire Wound Resistor	RE-90
R2309	10,000 ohm 10 Watt Wire Wound Resistor	RE-90
R2311	250,000 ohm Carbon Potentiometer	RE-238
R2312	2,200 ohm 1 Watt Composition Resistor	RE-7
R2313	47,000 ohm 1 Watt Composition Resistor	RE-22
R2314	6,800 ohm 1 Watt Composition Resistor	RE-13
R2315	1 Megohm 1 Watt Composition Resistor	RE-32
R2316	680 ohm 1 Watt Composition Resistor	RE-36
R2317	3,000 ohm 50 Watt Wire Wound Resistor - Adjustable	RE-610
R2318	100,000 ohm 2 Watt Composition Resistor	RE-179
R2319	470 ohm 1 Watt Composition Resistor	RE-2
R2320	1,000 ohm 1 Watt Composition Resistor	RE-5
R2321	220 ohm 1 Watt Composition Resistor	RE-1
R2322	500 ohm 50 Watt Adjustable Wire Wound Resistor	RE-221
R2323	10 ohm 1 Watt Composition Resistor	RE-308
R2324	10 ohm 1 Watt Composition Resistor	RE-308
R2325	100 ohm 1 Watt Composition Resistor	RE-260
R2326	100 ohm 1 Watt Composition Resistor	RE-260
R2327	100 ohm 1 Watt Composition Resistor	RE-260
R2328	100 ohm 1 Watt Composition Resistor	RE-260
R2329	100,000 ohm 1 Watt Composition Resistor	RE-26
R2330	150,000 ohm 1 Watt Composition Resistor	RE-27
R2331	1,000 ohm 1 Watt Composition Resistor	RE-5
R2332	15,000 ohm 1 Watt Composition Resistor	RE-16
R2333	220 ohm 1 Watt Composition Resistor	RE-180
R2334	200 Ohm 5 Watt Wire Wound Resistor	RE-609
S2301	3 PDT Toggle Switch	SW-19
SR2301	Full Wave Selenium Rectifier	SR-5
T2301	Driver Transformer	TR-9
T2302	Output Transformer	1138
T2303	Power Transformer	1186
TF2301	60 Cycle Tuning Fork	846-1
V2301	6SJ7 Vacuum Tube	TU-10
V2302	6F6 Vacuum Tube	TU-8
V2303	6H6 Vacuum Tube	TU-9
V2305	6F6 Vacuum Tube	TU-8
V2306	807 Vacuum Tube	TU-7
V2307	807 Vacuum Tube	TU-7

NOTE: ORDER PARTS BY AMPEX CATALOG NUMBER ONLY!

Reference Number	Description	Ampex Catalog Number
V2308	OD3/VR150 Vacuum Tube	TU-2
V2309	OD3/VR150 Vacuum Tube	TU-2
V2310	5R4GY Vacuum Tube	TU-59
V2311	5R4GY Vacuum Tube	TU-59
V2312	6SN7 Vacuum Tube	TU-13
	Voltage Control Knob	KN-1
	Condenser Insulating Washer	6094