

SECTION 2

INSTALLATION

2.1 MOUNTING AND INTERCONNECTING

IMPORTANT:

Before operating the recorder, read the following sections on INSTALLATION and OPERATION.

CAUTION:

Do not attempt to lengthen the head cables. Additional cable capacity will affect the frequency characteristics. The shield on the cable from the Power Supply to J408S on the Electronic Assembly must be grounded at both ends. This is particularly important in broadcast studio installations if the possibility of RF pickup is to be eliminated. Ground the Power Supply end under one of the mounting screws for the electrolytic condenser (C603) wafer, and the Electronic Assembly end under one of the J408S mounting screws.

A. Console Models: Cabinet and components are packaged separately. Assembly hardware is provided. Assemble as follows: (1) Install Tape Transport in cabinet frame and secure with 8 oval-head screws and finishing washers. (2) Insert 2 springs in holes in electronics frame of cabinet (3) Install Electronic Assembly, completing required plug-in connections between it and the tape transport. Use four knurled nuts to secure assembly to cabinet. (4) Remove back panel of cabinet and install Power Supply on small shelf at rear. Secure with two round-head screws. Plug Power Supply Cable into Electronic Assembly. (5) Plug input, output, and AC power cables into rear of Electronic Assembly and replace back panel of cabinet so that all cables run freely through the semi-circular cuts in its lower edge. **IMPORTANT:** The back of the console cabinet must be spaced at least 4" from the wall to permit proper ventilation.

B. Two Case Portable Models: The portable machine is shipped in a ready to operate condition, except for the connections of interconnecting cables.

To operate the recorder place the Mechanical Assembly Case to the right of the Electronic Assembly Case. Unlatch and remove the top cover and open the cable access door on the left side of the Mechanical Assembly Case. Unlatch and remove the front and rear covers on the Electronic Assembly Case.

Uncoil the interconnecting cables from behind the cable access door and plug them into mating receptacles at the rear of the Electronic Assembly.

Connect the input, output, and AC power to the rear of the Electronic Assembly.

C. Rack Mount Models: The rack mount machine should be mounted on a standard 19 inch relay rack with the Mechanical Assembly above the main Electronic Panel. The Electronic Power Supply Panel should be mounted directly above the Mechanical Assembly to eliminate the possibility of 60 cycle field from entering the Electronic Assembly.

If two Model 350 Recorders are to be mounted on a Standard rack, the following placement is recommended (starting at the top of the rack):

1. Install a spacer panel at the top of the rack if desired.
2. Install below this panel the Mechanical Assembly for machine #1.
3. Install the Electronic Assembly for machine #1.
4. Install a spacer panel.
5. Install the Mechanical Assembly for machine #2.
6. Install the Electronic Assembly for machine #2.
7. Install a spacer panel.
8. Install both Power Supply Panels at the bottom. (The cable on the power supply for the upper recorder will have to be extended in length. Extension cable #3814 is available for this purpose.)

The numbers set off in parentheses in the following text are reference numbers that refer to the Parts List (Section 6) and the figures in the rear of this book.

2.2 AC POWER:

Connect the Power Cable, Catalog #2413, from the AC Power Input Connector (J409P) on the Electronics Assembly to a source of 115 Volt AC power.

IMPORTANT: This machine is available for either 50 or 60 cycle operation. The power line frequency is indicated on the serial number plate which is located on the Power Supply Panel for rack mount machines, on the exterior of each case in the portable machines, and on the back of the console cabinet.

2.3 OUTPUT: Refer to Figure 1 or 2.

A. For Studio Line:

Plus 4 VU, 600 ohm line output, balanced or unbalanced, is available across Terminals 2 and 3 of the Line Out Connector, (J404P). Pin 1 is the chassis ground. If unbalanced output is desired, tie either side of the line to ground. It is necessary to supply 600 ohm termination to this output at all times in order to maintain correct meter calibration while recording or playing back. Therefore, 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, (S404), must be switched to ON.

B. For Connection to High Impedance Amplifier Input:

Connect pin 3 of the Line Out Connector, (J404P), to the high side of the amplifier input. Strap pins 1 and 2 of the connector and connect to the ground side of the amplifier input. The Line Out Termination Switch (S404), must be left in the position designated ON at all times, as explained in A above.

2.4 INPUT: Refer to Figures 1 or 2 and 5.

The following inputs are provided:

A. Microphones:

Any low impedance microphone, the nominal impedance of which is in the range of 30 to 250 ohms can be plugged in directly. Connect the microphone to pins 2 and 3 of the Input Connector, (J401S). Connect cable shield to pin 1. Place the Input Transfer Switch, (S401), in the MIC position.

The microphone input transformer is strapped for the optimum step up for a 150 to 250 ohm source. In the case of microphones having 50 ohms or less impedance, 6 db additional gain can be obtained by strapping the input as shown in Figure 5B. This is not usually necessary, however, and should not be done unless insufficient gain is found to exist. If the input is re-strapped, serious frequency discrimination will exist should the input be fed from a source impedance greater than 50 ohms. **IMPORTANT:** R402 and R403 will have to be changed to 24 ohms and R401 and R404 to 68,000 ohms to maintain a flat response on Balanced Bridging when the transformer is strapped for 50 ohm source impedance.

High impedance microphones are not recommended for use on this equipment. In general, the quality obtainable from high impedance microphones is not satisfactory for professional work. In the event that it becomes necessary to connect a high impedance microphone, the input circuit will have to be re-wired as shown in Figure 5A.

B. Bridging a Balanced Studio Line:

Connect a balanced line to pins 2 and 3 of the Input Connector, (J401S). Pin 1 is ground. Place the Input Transfer Switch, (S401), in the **BALANCED BRIDGE** position. Input levels of minus 10 to plus 10 VU can be accommodated. The load placed on the line is approximately 300,000 ohms.

For bridging higher or lower level lines, an external bridge can be wired in the line to the machine. This would consist of two resistors, the value of which should be from 15,000 to 30,000 times the RMS program voltage, in series with each side of the line. A 24 ohm $\pm 5\%$ resistor should terminate each leg of the output side of the two bridging resistors. The junction of the two 24 ohm resistors should go to chassis ground. The output of the bridge must be fed to the microphone input of the recorder. The input of the recorder may be connected for any impedance from 50 to 250 ohms.

C. Bridging an Unbalanced Source:

Connect an unbalanced line, radio tuner, etc., to pins 1 and 3 of the Input Connector (J401S). Pin 1 is the ground side. Place the Input Transfer Switch, (S401), in the **UNBALANCED BRIDGE** position. This connection provides a 60,000 ohm bridging input for any RMS program voltage greater than 1/2 volt. To increase the input impedance above 60,000 ohms, a series resistance of 330,000 ohms can be wired into the input plug in series with pin 3 and the input cable. This will necessitate an input voltage of at least 2-1/2 volts RMS. It is important that this resistor be physically placed in the cable connector that plugs into the Recorder Input (J401S) in order that the cable capacity be on the input side of the resistor.

2.5 PHONES:

Any sensitive head phones can be plugged in the Phone Jack (J403S), provided for monitoring the incoming line or playback output.

2.6 REMOTE CONTROL: Refer to Figure 15.

The operation of the Tape Transport mechanism can be remote-controlled through the use of an Ampex Catalog #5763 or 5763-1 Remote Control Unit. The catalog #5763 unit is supplied in a wooden case and is completely wired, ready to plug into the Remote Control Connector, (J502S), on the front of the Tape Transport Circuits Assembly. The catalog #5763-1 unit is mounted on a flat plate for installation in studio consoles, and is not wired. To install, wire as shown in Figure 15, and plug into J502S.

NOTE: Whenever the Remote Control unit is not connected, the Dummy Plug (P502P), supplied with the machine, must be plugged into J502S.

2.7 60 CYCLE AMPLIFIER: (For Drive Motor Power)

The Ampex Model 375 Precision 60 cycle amplifier or Model 381C Speed Lock Equipment can be plugged in directly at J503S. No other connections are necessary. If either of these units is used with the recorder, the Control Circuits Fuse (F402) must be increased to 5 Amperes. Do not remove the Dummy Plug (P503P) unless one of these units is to be connected.

2.8 ACCESS TO CONSOLE CABINET:

WARNING: Before opening the console or portable cases, disconnect AC power.

Complete accessibility for inspection or service is provided to the top and bottom of the Electronic Assembly and bottom of the Mechanical Assembly. See Figure 16 for an illustration of the Console Cabinet opened for full accessibility.

Opening Procedure:

1. Remove the four cap nuts securing the Electronic Assembly to the Cabinet.
2. Pull the Electronic Assembly up until the runners are free of the slots. Reinsert the runners in the short slots immediately in front of the two lower studs.
3. Remove the two set screws holding the chassis bottom plate. The bottom plate hinges separate at the rear if it is desired to remove the plate completely.
4. The frame on which the Mechanical Assembly is mounted can be raised 90 degrees or more, and held in place by

a slide bolt on the lower left underside of the frame.

5. The Power Supply is accessible through the rear of the console when the sliding panel is removed.

2.9 ACCESS TO UNDERSIDE OF MECHANICAL ASSEMBLY IN TWO CASE PORTABLE

Stand Mechanical Assembly Case on end as shown in Figure 17. Release the latches holding the center divisions of case. Open to approximately 90°. Care must be taken to insure that cables can pass through cable compartment into the main cabinet freely.

2.10 OVERALL PERFORMANCE CHECK: (Read Section 3 on OPERATION before making these checks.)

The following procedure is recommended for checking the performance of this recorder at the time of installation and as necessary thereafter.

A. Overall Frequency Response:

Thread a new reel of tape on the machine. Equalization curves for the Record and Playback Amplifiers are shown in Figures 6 and 7. Entirely satisfactory results can be obtained from any professional quality tape.

1. 3-3/4 and 7-1/2 Inch Response

DUE TO THE NATURE OF THE PRE-EMPHASIS IN THE RECORD CIRCUIT, TAPE SATURATION WILL OCCUR AT THE HIGH FREQUENCIES UNLESS THE RESPONSE CHECK IS MADE AT LEAST 20 DB BELOW NORMAL OPERATING LEVEL.

Therefore, check the response with a sensitive meter such as a Hewlett-Packard 400C connected to the output. In absence of a sensitive meter, a standard VU Meter preceded by a flat amplifier with at least 20 db gain can be used. Response will be within the limits indicated in the Specifications.

2. 15 Inch Response

Make the response check approximately 10 db below operating level to avoid saturation effects. Response will be within the limits indicated in the Specifications.

B. Overall Noise Measurements:

Overall wide band noise should be measured with a Vacuum Tube Voltmeter such as Hewlett-Packard 400C while playing back a tape that has previously been erased on the machine.

First: Erase the tape with the input to the Record Amplifier shorted. Rewind and play this tape back. Performance should fall within the limits specified under SIGNAL-TO-NOISE RATIO in Section 1. No attempt should be made to measure wide band noise while simultaneously recording and playing back as leakage of the 100 KC bias into the playback head may interfere with the measurement.

C. Distortion:

Overall distortion can be measured by connecting any standard distortion measurement apparatus across the output. The readings from a wave analyzer or selective fre-

quency 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.

D. 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 .2% at 15 inch, .25% at 7-1/2 inch, and .3% at 3-3/4 inch speeds.

For more information on alignment or performance checking, refer to Section 5.