SECTION 6A

MODEL 280 WITH MOTION SENSING

6A1.1 DESCRIPTION

The Scully Model 280 Recorder/Reproducer with Motion Sensing contains automatic tape motion-sensing circuits which permit any operator to control the equipment without danger of tape stretch or breakage on STOP or when switching from one mode to another. It is not necessary to wait for the motion of the tape to cease before initiating operation in a different mode.

The motion-sensing circuits are located in the relay control and tape deck subassemblies of the tape transport.

Except for the motion-sensing provision and the use of an appropriately different remote control unit, the Model 280 with Motion Sensing is identical to the basic Model 280 described earlier in this manual. All of the differences are covered in the remaining paragraphs of the present section.

The remaining paragraphs of this section are direct substitutions for the similarly numbered paragraphs in sections 1 through 5 of this manual. All other paragraphs in sections 1 through 5 are wholly applicable to the Model 280 with Motion Sensing.

6A2.7 REMOTE CONTROL

The Scully 280 Deluxe Remote Control Unit, Catalog No. 504210100-01, is required for remote-control operation of the Model 280 with Motion Sensing. See Figure 8-18 in the Reference Drawings section for the schematic diagram of this remote control unit. (Other statements pertaining to the remote-control feature, in paragraph 2.7 of the basic Model 280 instructions, are equally applicable to the Model 280 with Motion Sensing.)

6A3.3 OPERATING PROCEDURE

6A3.3.1. Preliminary

a. Tape Threading. Thread tape as shown in figure 6A-1. (The rest of the instructions in paragraphs 3.3.1 through 3.3.3 of this manual are equally applicable to the Model 280 with Motion Sensing.) See also Figure 6A-2.

Figure 6A-1. Photograph of Motion-Sensing Transport

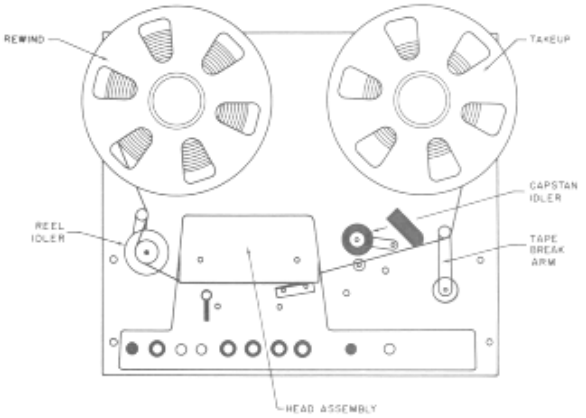


Figure 6A-2. Tape Threading Path (Model 280 with Motion Sensing)

6A3.3.4. Stopping the Unit

Paragraph 3.3.4 in Section 3 of this manual applies to the Model 280 with Motion Sensing except for the following differences:

a. If operation is started in the Play mode with no tape threaded, it will be necessary to actuate the motion sensor (figure 6A-2) by hand to return the equipment to the Stop condition.

b. Once the machine is in operation, it will not be necessary to wait for tape motion to cease before pressing the REWIND, F. FWD, or START button.

6A4.1 TAPE TRANSPORT DESCRIPTION

6A4.1.1. Tape Drive

Any motion-sensing Model 280 employs a three-motor drive system -- a two-speed hysteresis synchronous capstan drive motor and two induction-type torque motors. The capstan motor and the solenoid actuated pressure roller drive the tape at a uniform speed in the Playback, Record, and Edit modes. The capstan motor has two sets of windings to provide a high and a low tape speed, either of which may be selected by the CAPSTAN speed switch, located on the control panel of the tape transport.

When the START button is pressed, the capstan solenoid and brake solenoids are energized. The capstan solenoid engages the rubber pressure roller to the capstan by means of a mechanical linkage, pressing the tape between the roller and capstan firmly. The capstan motor provides the constant tape speed; constant tape motion is assured by the clamping action of the pressure roller.

In the fast modes (Forward and Rewind), the torque motors drive the tape and the capstan motor and pressure rollers are inactive. The motor acting as takeup runs with full voltage; the one on the supply side operates with low voltage so as to provide proper tape tension and prevent a loose wind.

6A4.1.2. Brake System (See figures 4-1, 6A-3, 8-1, 8-6, and 8-8.)

The Model 280 brake system is basically electrical. It consists of two solenoid operated brake shoes for the supply and take-up torque motors, a sensing circuit to recognize the direction of tape travel, and a resistance-capacitance delay network. Mechanical braking is used only to hold the motors in the stopped condition and to prevent free-wheeling of tape reels in the event of a power failure.

The sensing circuit consists of the sensing switch assembly (S113) which is located in the tape guidance system between the take-up motor and the capstan idler, a pair of sensing relays K108 and K109 for logic control under

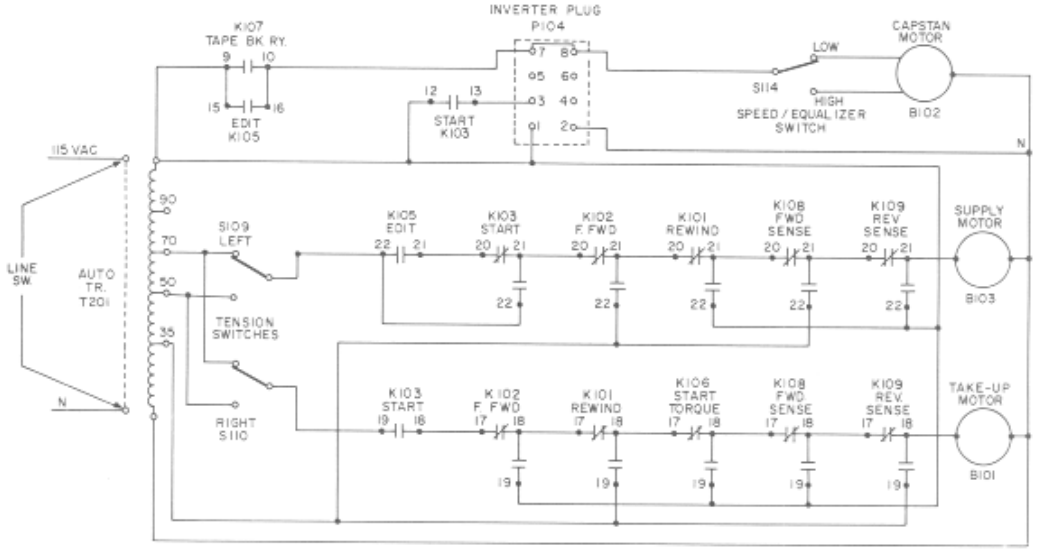


Figure 6A-3. Model 280 with Motion Sensing, AC Circuits - Simplified

forward and reverse tape-travel conditions, an RC network, and a capstan solenoid relay K110 which performs supplementary control functions for the active sensing relay. The brake shoe solenoids are L104 and L105 (figure 8-8) and the RC network consists of R121 and C124.

In any mode except edit, the brake shoes are released by energizing L104 and L105 when tape-transport operation is initiated. Later, when the STOP button is pressed, the sensing circuit reverses the direction of tape travel by changing the voltage connections to the two torque motors. Meanwhile, the same circuit holds out the brake shoes until the tape has stopped and begun to move in the opposite direction. When the opposite movement begins, L104, L105, and the torque motors are de-energized, and the motors are braked During the tape reversal, full line voltage is applied to the appropriate motor and drag (holdback) voltage to the other motor. This insures a smooth stop. At the start of the switching transfer, the RC circuit supplies coil current to the sensing circuit until the appropriate sensing relays are locked in.

NOTES

No sensing action is involved in the Edit mode. In this case, the take-up motor brake shoe remains applied and the supply motor brake shoe is re-applied at the moment the STOP button is pressed. (See paragraph 6A4. 2. 5.)

Figure 4-1, Disc Brake Outline, in the standard Model 280 instructions is equally applicable to the Model 280 with Motion Sensing. (There are no differences in the brakes themselves.)

The sensing switch S113, which assumes either of two positions determined by the direction of tape travel, is the controlling element of the sensing circuit. Depending on its position, this switch energizes the forward sense relay K108 or reverse sense relay K109 when the STOP switch S107 is pressed. At that time, the RC circuit supplies the actuating voltage and prevents the brake-shoe solenoids from being de-energized before the sense relay operates. Once energized, the sense relay locks itself in and performs the appropriate voltage switching for the two motors while also keeping the brake-shoe solenoids energized. When the tape begins to move in the opposite direction, the sensing switch moves to the opposite position, breaks the locked circuit, and returns the sense relay to its normally de-energized condition. This causes the brake-shoe solenoid circuits to be opened as well as the voltage connections to the two motors.

The capstan solenoid relay K110 is energized at any time either sense relay is operated, and shares the same locked circuit. For the functions of this relay and other sensing circuit details, see paragraph 6A4. 2.

The mechanical adjustment of the brake shoes is not critical, but should be balanced and set for easy cueing.

6A4. 1. 3. Tape Tension

The control system contains all the elements necessary to provide proper tape tension in all modes of operation.

In the start mode, the voltage supplied to the torque motors is governed by the position of the individual reel switches, being either 50 volts AC or 70 volts AC. In the fast mode, the torque motor serving the reel acting as the supply operates under reduced voltage (35 volts) while the motor for the reel acting as take-up receives full line voltage from the power supply.

NOTE

Paragraphs 4. 1. 4, 4. 1. 5, and 4. 1. 6 of this manual are equally applicable to the Model 280 with Motion Sensing. Therefore, no counterparts of these paragraphs are provided here.

6A4. 1. 7. Control and Power Circuits
(See figures 6A-3, 8-6, and 8-8.)

All of the tape transport control power circuits are contained in the electrical control chassis which is mounted directly behind the tape transport main panel. This assembly also contains all the switches, relays, and capacitors which control tape transport operation in all modes. All motor assemblies and interconnecting cables plug into the chassis individually. All high voltage AC connections are protected, either in connectors or by covered relays.

When not being operated by remote control, dummy plug P103 must be inserted into socket J103 on the control chassis.

Tape transport controls, except the tape break switch S108, are located under the tape transport main panel, are mounted on one edge of the control chassis, and are accessible from the top of the machine through the Operations Control Panel.

6A4.2. OPERATION
(See figures 6A-3, 8-6, and 8-8.)

6A4.2.1. Turn On

Standby power is applied to the tape recorder/reproducer by actuating the POWER switch S101 (fig. 8-8). In its ON position, this switch activates the internal power supplies, lights the STOP pushbutton lamp DS101, and lights all meter lamps in the electronics circuits. On the activation of the 24-vdc control power supply, the head shield solenoid L101 is energized, whereupon the head shield immediately drops down and remains in the lowered position. At the bottom of its travel, the head shield actuates the head shield microswitch S111, which then closes one side of the tape lift solenoid circuit (L102) and places a resistor, R115 in series with L101. This resistor protects the head-shield solenoid coils from being overheated when the machine remains at rest in the standby condition for an extended time. If tape has been threaded, the tape break relay K107 is also energized when the 24-vdc control power supply is activated.

6A4.2.2. Start and Record

6A4.2.2.1. Start

The START pushbutton switch S105 is used to start the movement of the tape for a playback or record operation of the machine. This switch energizes the start relay K103 which then locks itself in through its own contacts 6 and 7. The START lamp DS103 immediately lights when the START switch is pressed and remains lighted as long as the start relay is energized. Meanwhile, the following other events take place:

The brake-shoe solenoids L104 and L105 are energized through K103-15, 16, and remove braking friction from the take-up and supply drives.

The capstan solenoid L103 is energized through K103-9, 10 and engages the capstan pressure roller. The start torque relay K106 is momentarily energized through K103-6, 7 but drops out when C122 becomes charged. Here the charging time constant is determined by C122 and R116. This action briefly applies full line voltage to the take-up motor via K106-18, 19, thus overcoming the inertia of the take-up reel.

The head shield solenoid L101 is de-energized by the opening of the normally closed start relay contacts 8 and 9. As the result, the shield is released and mechanically sprung upward, and the head shield microswitch S111 returns to its original position. In this condition, S111 disconnects the positive side of the circuit to L102 and shorts out the limiting resistor R115 on the positive side of L101.

Since the coil of K103 is energized in series with normally closed contacts of the rewind and fast forward relays K101 and K102 and normally open contacts of the tape break relay K107, the start relay drops out when the REWIND or FAST FORWARD pushbutton switch is pressed or when a tape break occurs. The start-relay dropout produced by the STOP switch S107 is discussed in subparagraph 6A4.2.6.

6A4.2.2.2. Record

The RECORD mode switch S106 is interlocked with the start relay on K103-6, 7. The START button must be pushed before the record mode can take effect in the amplifier. No tape-transport function is initiated or controlled by the record circuit.

The RECORD switch S106 on the tape-transport control panel energizes the record relay K602, which permits bias and erase energy to be applied to their respective magnetic heads. The RECORD lights DS102 and DS601 are lighted when K602 is energized.

Record and playback equalization is switched with tape speed, and both are controlled by the capstan speed switch S114. This switch activates the equalizer relay K601 in the amplifier and provides high-speed equalization. Low-speed equalization normally is provided by the relay when de-energized.

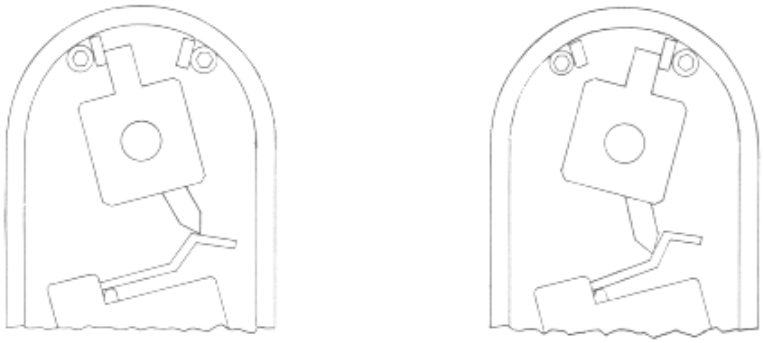


Figure 6A-4. Motion Sensing Adjustment

6A4.2.3. Tape Lift and Motion Sensor Microswitches

6A4.2.3.1. Tape Lift Microswitch

The tape lift microswitch S112 serves to make a distinction between the start mode of operation and either the reverse or fast forward winding mode. In the start mode (head shield up), the tape lift microswitch places an open circuit in the path of the capstan solenoid relay contacts K110-12, 13, which then cannot energize the tape lift solenoid L102 on stop. In either winding mode (head shield down), S112 is closed. This permits the closure of K110-12, 13 to keep L102 energized, and thus to continue to hold the tape away from the heads during the stop operation. (See also 6A4.2.3.2, 6A4.2.4, 6A4.2.5, and 6A4.2.6.)

6A4.2.3.2. Motion Sensor Microswitch

The motion sensor microswitch S113 serves to determine the direction of tape travel and to set the relay logic circuits for dynamic braking. As shown in figure 6A-3, a definite toggling action occurs in either the Forward or Rewind mode. Some slight overtravel normally occurs after the switch has been actuated.

6A4.2.4. Rewind and Fast Forward

6A4.2.4.1. Rewind

Pressing the REWIND switch S102 energizes the rewind relay K101, which then locks itself in through its own contacts 6 and 7 and the normally closed contacts 14 and 15 of the fast forward relay K102. This applies full line voltage to the tape supply motor (contacts 21 and 22) and holdback voltage to the take-up motor (contacts 18 and 19). Brake shoes are released (15 and 16) and the tape lift solenoid L102 is energized through K101-12, 13 and the head shield microswitch S111; thereupon the tape is lifted safely away from the heads. The microswitch S111 insures that L102 is not energized, however, until the head shield has dropped below the tape path, since the shield has to be bottomed to actuate the microswitch and thus close the positive side of the tape-lift solenoid circuit. The sensing switch S113 assumes the appropriate position for reverse tape travel, but has no electrical effect at this time.

6A4.2.4.2. Fast Forward

The effects of the FAST FORWARD switch S103 are similar to the rewind conditions just described, but have the opposite sense. In this case, the fast forward relay K102 is locked on, full line voltage is applied to the take-up motor, and holdback voltage is applied to the supply motor. Brake shoes are released and the tape lift solenoid is energized as in the rewind mode, but the events are controlled by the fast forward relay. The sensing switch S113 assumes the opposite position, but (again) has no electrical effect at this time.

6A4.2.5. Edit

The EDIT pushbutton (switch S104) energizes the edit relay K105 through normally

closed contacts of the capstan solenoid relay K110. The edit relay then locks itself in through its own contacts 6 and 7 and applies drive voltage to the supply motor through contacts 21 and 22. Contacts 9 and 10 of K105 release the brake shoe from the supply motor, while contacts 8 and 9 keep the take-up motor braked by opening the negative side of the circuit to L105. As the result, tape is immediately paid out from the supply reel without being wound on the take-up reel. (This allows the tape break switch S108 to open and thereby disable the sensing circuit described in subparagraph 4.2.6; however, no sensing is necessary in the edit mode.) Contacts 12 and 13 of the edit relay close to energize the capstan solenoid L103. The capstan motor is energized through K105-15, 16, which bypass the now-open contacts 9 and 10 of the tape break relay K107. Contacts 18 and 19 of K105 place an effective short across the delay capacitor C124 to permit rapid discharge with a resulting quick removal of operating voltage from L104 at the time the STOP button is pressed; this causes the supply brake to be applied.

6A4.2.6. Stop

The STOP switch S107 has two functions: one to open the common for the mode-switching-relay coils and the other to operate the sense relays K108 through K110. The sense relays to be energized are determined by the position of the sensing switch S113, which depends on the direction of tape travel.

6A4.2.6.1. Start to Stop

In the start mode, the tape travels forward. Pressing the STOP switch de-energizes the start relay K103 and energizes the reverse sense relay K109. The latter event is insured by the charge on C124 in the brake delay network, which also keeps the brake-shoe solenoids energized during the switching transfer between the two relays. The capacitor discharge is delayed by R121. The sense relay K109 then locks itself in through its own contacts 6, 7 and 12, 13, the sensing switch S113, and normally closed contacts of the rewind and fast forward relays K101 and K102. Meanwhile, the capstan solenoid relay K110 is energized through CR109 and also locked in. In this condition, the brake-shoe solenoid feed circuit is switched from K103-15, 16 to K109-12, 13; the normal run voltage is removed from both torque motors; full line voltage is applied to the supply motor, and holdback voltage is applied to the take-up motor. (See figure 6A-3 or 8-8.) The capstan solenoid relay contacts 9 and 10 and the start relay contacts 8 and 9 energize the head shield solenoid L101, while the start relay contacts 9 and 10 and capstan solenoid relay contacts 5 and 6 de-energize the capstan solenoid L103. Contacts 21 and 22 of K110 close to discharge the start torque charging capacitor C122 immediately. As soon as the direction of tape travel is reversed, the sensing switch moves to the opposite position and thus breaks the sensing-relay holding circuit at K109-6, 7. This applies the brake shoes by de-energizing the brake shoe solenoids and brings the tape transport to rest. The tape stop obtained from the use of the STOP switch is smooth, and the reverse tape travel needed to reverse the sensing switch is quite small.

6A4.2.6.2. Rewind to Stop

When in the rewind mode, the relay K101 is de-energized by the use of the STOP switch S107, the rewind relay interlock contacts 8 and 9 return to their normally closed condition and allow the sensing circuit to pass a pulse of current from C124 through the back contacts of the STOP button switch S107. Since the tape motion at this time is in the reverse direction, the forward sensing relay K108 is energized and locks itself in through its own contacts 6, 7 and 12, 13 and the sensing switch S113. Thereafter the circuit events are the similar to those described in subparagraph 6A4.2.6.1. However, the capstan solenoid relay K110 is energized via CR108, the rewind relay removes the full line voltage from the supply motor, and the forward sensing relay applies full line voltage to the take-up motor. The brakes are applied and the tape transport rests when S113 breaks the circuit to K108 at the time the tape begins to move in the opposite direction. While the holding circuit is actuated, the tape lift solenoid L102 is kept energized by the switching transfer from K101-12, 13 to K108-12, 13, since the tape lift microswitch S112 is closed at this time. (See subparagraph 6A4.2.3.1.) When the tape motion stops, the tape lift microswitch returns to its home position.

6A4.2.6.3. Fast Forward to Stop

In this case, the action is the same as described for Rewind to Stop in sub-paragraph 6A4.2.6.2. above, except that the fast forward relay K102 and reverse sense relay K109 are substituted for K101 and K108, the voltage switching actions at the motors are interchanged, and the tape motions are in opposite directions.

6A4. 2. 6. 4. Fast Forward or Rewind-Stop-Rewind or Fast Forward

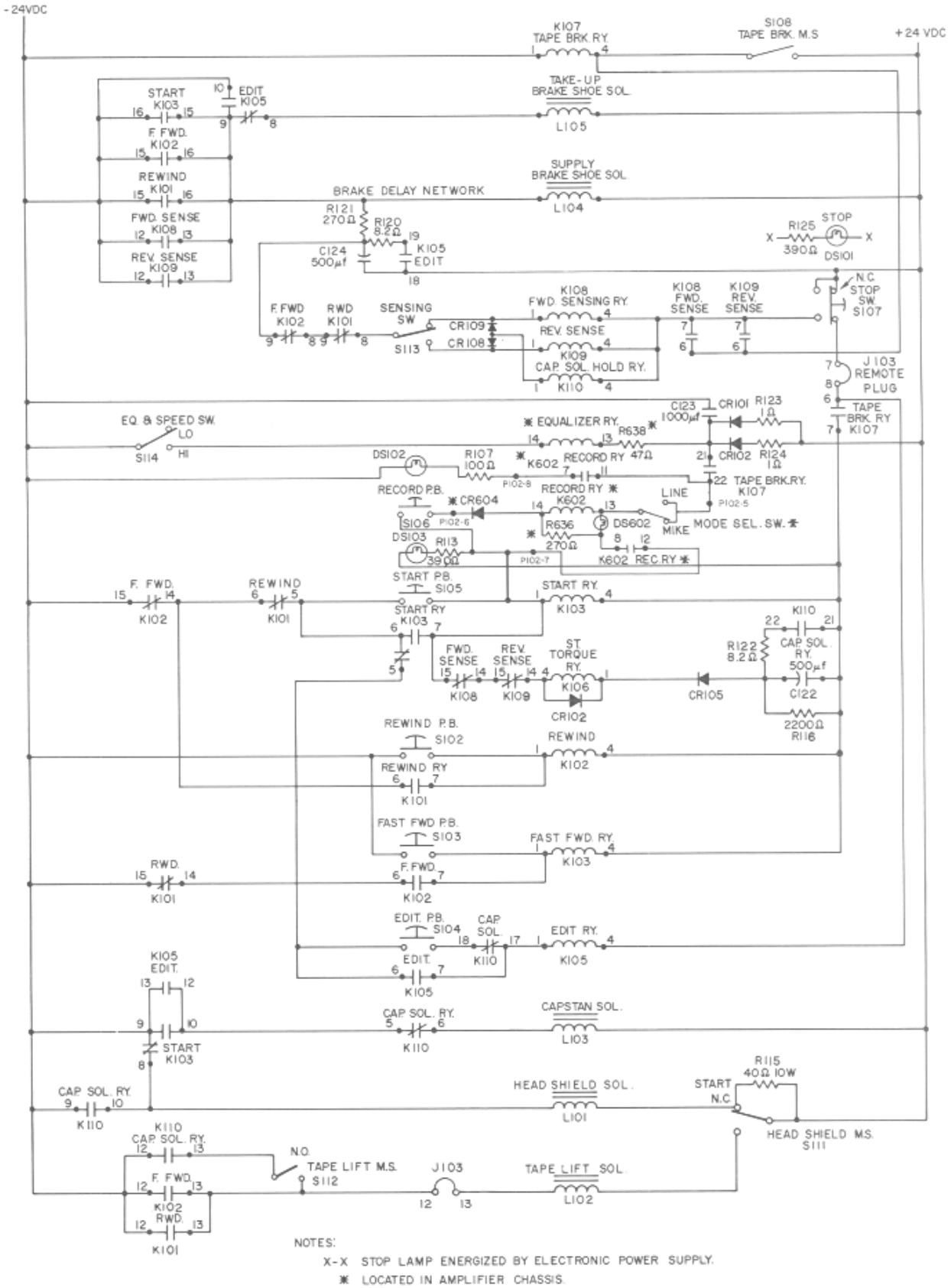
Switching to the rewind or fast forward mode after the STOP button has been pressed is possible because the rewind or fast forward interlocking contacts (8 and 9) will open and disconnect the sensing relay circuit and return the equipment to a normal winding mode.

6A4. 2. 6. 5. Winding Mode to Start Mode

To switch the machine from either winding mode to the start mode, it is only necessary to press the STOP button and then the START button. This may be done in rapid succession because the machine will first come to a stop as previously described (subparagraphs 6A4. 2. 6. 2 and 6A4. 2. 6. 3.) and then will immediately operate in the start mode. When the START button is pressed while the tape is still in motion, the start relay is energized before the stop cycle has been completed. In this case, the head shield solenoid remains energized through the capstan solenoid relay contacts K110-9, 10, the tape lift solenoid remains energized through K110-12, 13 and S112, and the capstan solenoid is kept de-energized by K110-5,6 until the sensing relays are normalized by the tape controlled action of S113. Meanwhile, contacts 14 and 15 of K108 or K109 keep the start torque relay disabled. When the sensing relays are normalized, the sense holding circuit is opened and operation begins in the start mode as described in subparagraph 6A4. 2. 2. At that time, the capstan solenoid relay K110 releases the head shield solenoid L101 and tape lift solenoid L102, energizes the capstan solenoid L103, and removes the effective short from C122 and R116. Simultaneously, the sensing circuit closes the negative side of the current path to the coil of the start torque relay K106, and, since the start holding circuit is already closed, full line voltage is momentarily applied to the take-up motor.

MECHANICAL TROUBLESHOOTING

If the tape transport in the Model 280 with Motion Sensing fails to stop when the STOP button is pressed, readjust the motion sensor S113 and check continuity through this switch (fig. 6A-4). Readjust or replace, as necessary. For other mechanical troubleshooting suggestions, see table II in section 4 of this manual.



NOTES:

X-X STOP LAMP ENERGIZED BY ELECTRONIC POWER SUPPLY.

✱ LOCATED IN AMPLIFIER CHASSIS.

Figure 6A-5. Model 280 with Motion Sensing, DC Circuits - Simplified

SECTION 6B

MODEL 280/SP-14

6B1.1 DESCRIPTION

The Model 280/SP-14 Recorder/Reproducer is similar to the basic Model 280 covered in sections 1 through 5 of this manual, differing only in reel sizes and the improved control of tape tension. Early Model 280/SP-14 equipments are designed for 14- and 10-1/2-inch tape reels only, but later versions also accommodate 7-inch reels. In the latest versions, supply reels and takeup reels of unequal sizes can be employed in any mode of operation.

The following paragraphs cover the differences between the Model 280/SP-14 and the basic Model 280, and correspond with the similarly numbered paragraphs in sections 1 - 5. For equipments without motion sensing, all other paragraphs in sections 1 - 5 are completely applicable to the Model 280/SP-14, but figure 8-9 in the Reference Drawings section should be used in lieu of figure 8-7. For equipments with motion sensing, additional differences are covered in section 6A, and figure 8-10 in the Reference Drawings section should be used in lieu of figure 8-7.

6B3.2 CONTROLS AND INDICATORS

The REEL tension-selector switches (S109, S110) on the tape deck of the Model 280/-SP-14 are three-position switches that permit individual adjustments for 7-, 10-1/2-, and 14-inch reels. Any combination of reels may be used if the operating steps in paragraph 6B3.3 below are performed.

6B3.3 OPERATING PROCEDURE

a. Set REEL switches to the correct positions for the reels actually on the machine. Example:

14-inch supply reel - Set to HI.
(10-1/2-inch supply reel - Set to midposition)
7-inch takeup reel - Set to LO.

b. Do not change these settings while tape is in motion.

c. When operating in the Fast Forward or Rewind mode and using dissimilar reels, braking must be accomplished by dynamic means before the STOP button is pressed. If in Fast Forward, slow-down the tape by pressing REWIND; then, when the motion is almost stopped, press the STOP button. If in Rewind, slow-down the tape by pressing F. FWD; then, when the motion is almost stopped, press the STOP button.

NOTE

If the 280/SP-14 is equipped with motion-sensing provisions, you may disregard step c above and go to STOP immediately from either the Fast Forward or Rewind mode.

6B4. TAPE TRANSPORT

The control system (figure 8-9 or 8-10) has all of the elements necessary to insure proper tape tension in all modes of operation. (See also the simplified diagrams, figures 6B-1 and 6B-2.) In the Start mode, the voltage supplied to the torque motors is governed by the position of the individual REEL switches, being either 50 volts AC (7- and 10-1/2-inch reels) or 70 volts AC (14-inch reels). In either of the fast modes, the torque motor acting as supply operates under reduced voltage (35 volts AC); meanwhile the motor acting as takeup receives full line voltage (115 volts AC) from the power supply for the 14-inch or 10-1/2-inch REEL switch position (HI or MED) or 70 volts AC from the power supply for the 7-inch REEL switch position (LO).

NOTE

Early Model 280/SP-14 equipments have two-position tension selector switches.

The START pushbutton S105 is used to start the movement of the tape for a Record or Playback operation of the machine. This switch energizes the start relay K103, which then locks itself in through its own contacts 6, 7. (See figure 6-B1.) Meanwhile the following other events take place:

The brake shoe solenoids L104 and L105 are energized through K103-15, 16 and remove braking friction from the take-up and supply drives.

The capstan solenoid L103 is energized through K103-9, 10 and engages the capstan pressure roller.

The start torque relay K106 is momentarily energized but drops out when C122 becomes charged. Here the charging time constant is determined by C122 and R116. This action briefly applies full line voltage to the takeup motor via K106-18, 19, thus overcoming the inertia of the takeup reel.

The head shield solenoid L101 is de-energized by the opening of the normally closed start relay contacts 8, 9, and, as the result, the shield is released and mechanically springs upward while the head-shield microswitch S111 returns to its original position. In this condition, S111 disconnects the positive side of the circuit to L102 and shorts out the limiting resistor R115 on the positive side of L101.

When the REWIND switch S102 is actuated, K101 is energized and holds in through its own contacts 6, 7 and the normally closed contacts of the STOP switch. High torque is then applied to the supply motor through K101-21, 22 and the REEL tension selector switch S109. For the HI (14-inch) and MED (10-1/2-inch) positions, full line voltage is present. For the LO (7-inch) position, 70 volts AC is applied. Low torque (35 volts AC) is applied to the takeup motor via K101-18, 19. The brakes are released when the solenoids L104 and L105 are energized through K101-15, 16.

When the F. FWD switch S103 is actuated, K102 is energized and holds in through its own contacts 6, 7 and the normally closed contacts of the STOP switch. High torque is applied to the takeup motor through K102-18, 19 and the REEL tension selector switch S110. For the HI (14-inch) and MED (10-1/2-inch) positions, full line voltage is present. For the LO (7-inch) position, 70 volts AC is applied. Low torque (35 volts AC) is applied to the takeup motor via K101-18, 19. The brakes are released when the brake solenoids L104 and L105 are energized through K102.

NOTE

A pair of plastic wind guards is supplied for use with 14-inch reels when fast rewind would otherwise cause an irregular tape pack. Install guards either above or below the reels.

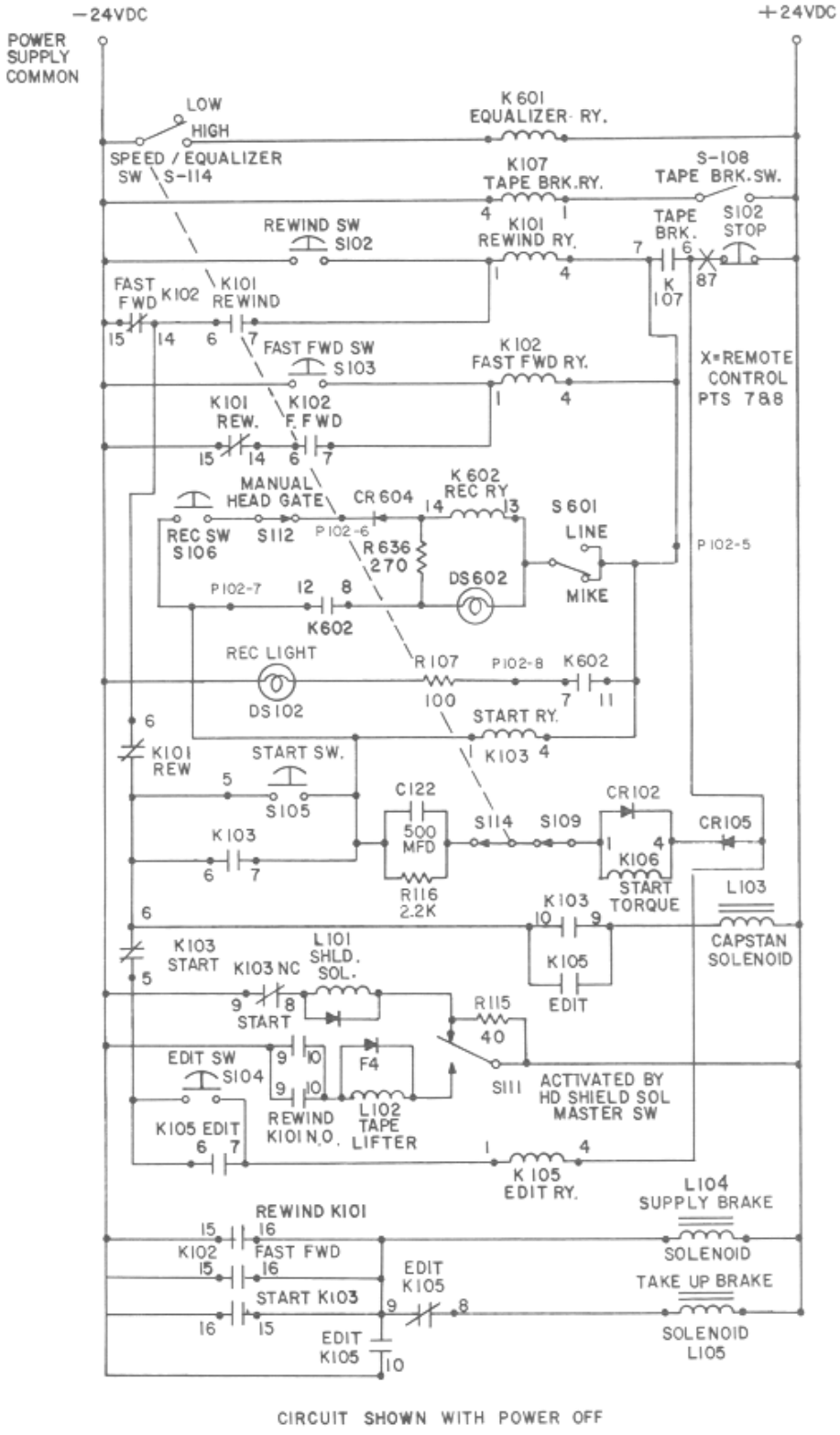
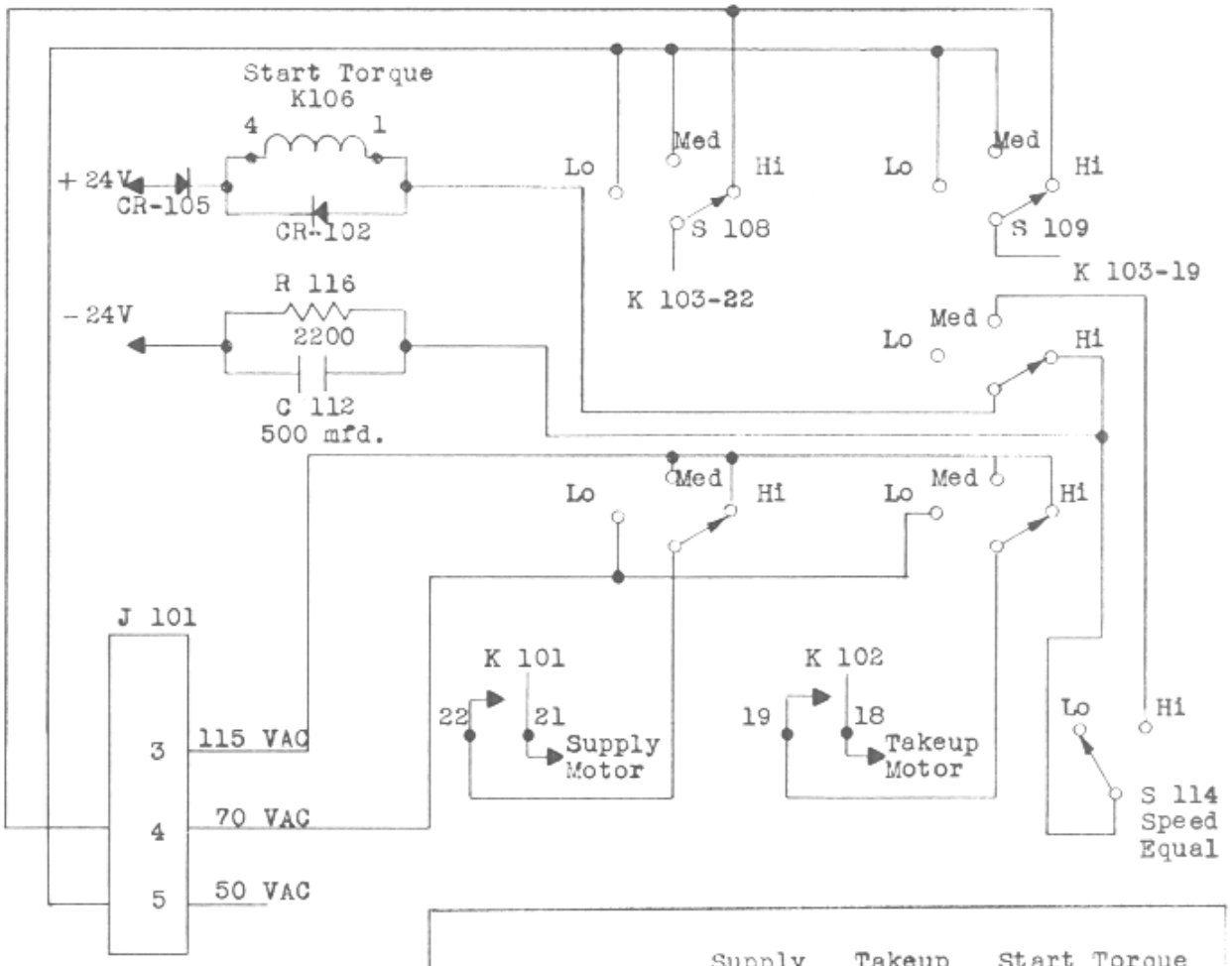


Figure 6B-1. Model 280/SP-14 DC Control Circuits - Simplified



			Supply	Takeup	Start Torque
PB	7"	Lo	50V	50V	No
	7"	Hi	50V	50V	No
	10"	Lo	50V	50V	No
	10"	Hi	50V	50V	Yes
	14"	Hi	70V	70V	Yes
	14"	Hi	70V	70V	Yes
Fast Fwd.	7"	Hi/Lo	35V	70V	No
	10"	Hi/Lo	35V	110V	No
	14"	Hi/Lo	35V	110V	No
Rewind	7"	Hi/Lo	70V	35V	No
	10"	Hi/Lo	110V	35V	No
	14"	Hi/Lo	110V	35V	No

Figure 6B-2. Model 280/SP-14 Tension Control Circuit - Simplified

SECTION 6C

MODEL 275 SERIES REPRODUCER

6C1.1 DESCRIPTION

The Model 275 Series Reproducer is a high quality playback machine for use in recording studios, broadcast stations, and other applications requiring exacting performance specifications.

The tape transport is similar to that of the Model 280 covered in sections 1 - 5 of this manual except that there are no Record facilities. The Model 275 can be obtained with manual or automatic head shields and tape lifters. Playback head configurations and tape speeds are identical to the Model 280.

The electronics assembly of the Model 275, like that of the Model 280, is mounted on a 3-1/2 x 19-inch panel. It contains preamplifiers and power amplifiers, is fully transistorized, and differs from the electronics assembly of the Model 280 chiefly in the absence of recording circuits.

The following paragraphs cover the difference between the Model 275 and the Model 280, and generally correspond with the similarly numbered paragraphs in sections 1 - 5 of this manual. Except for these differences, the instructions in sections 1 - 5 apply equally to the Model 275, but the following figures in the Reference Drawings section should be used in lieu of those listed opposite (below):

For Model 275 See	In Lieu of:
Figure 8-11	Figure 8-7
Figure 8-14	Figure 8-12
Figure 8-15	Figure 8-13
Figure 8-17	Figure 8-16

6C1.2 TECHNICAL SUMMARY

For the Model 275 tape transport, the technical summary in section 1, paragraph 1.2 of this manual is applicable except for the specifications pertaining to reel sizes and the omission of a RECORD control. Reel sizes up to 11-1/2 inches (rather than 11-1/8 inches) are accommodated in the standard Model 275 tape transport. (Fourteen-inch reel accommodations can be obtained on special order.) For other specifications, the following list is substituted for the Model 275:

TAPE TRANSPORT CONTROLS: Power on and off, monitor, individual reel size switches, rewind, fast forward, stop, start, speed change switch, edit, gain.

PREAMPLIFIER ADJUSTMENTS (located on rear of chassis): Playback high frequency equalization, preamplifier gain.

PREAMPLIFIER DISTORTION: Less than 0.5% total harmonic distortion at +18 dbm.

MAXIMUM PREAMPLIFIER OUTPUT: +18 dbm.

PREAMPLIFIER OUTPUT IMPEDANCE: 600 ohms.

POWER AMPLIFIER ADJUSTMENTS: (Located with tape transport controls).

POWER AMPLIFIER DISTORTION: 1% total harmonic distortion at rated output.

POWER AMPLIFIER OUTPUT: 3 Watts into 8 or 16 ohms.

POWER REQUIREMENTS: 117 Volts AC 50/60 cycles, 275 watts.

6C2.3. CABLE INTERCONNECTION

For mono units, the interconnecting cable consists of the amplifier power section and the magnetic head section. In the two-channel equipment, the cable consists of the requisite power and head sections. Before assembling the units, consult the interconnecting diagram (figure 6C-1) for the proper installation of cables.

Connect the small plug to the relay panel under the tape transport and the large 16-pin connector to the back of the amplifier. In multichannel units the 16-pin connectors are marked channel 1, 2, etc. to mate with their respective amplifiers, which are similarly identified.

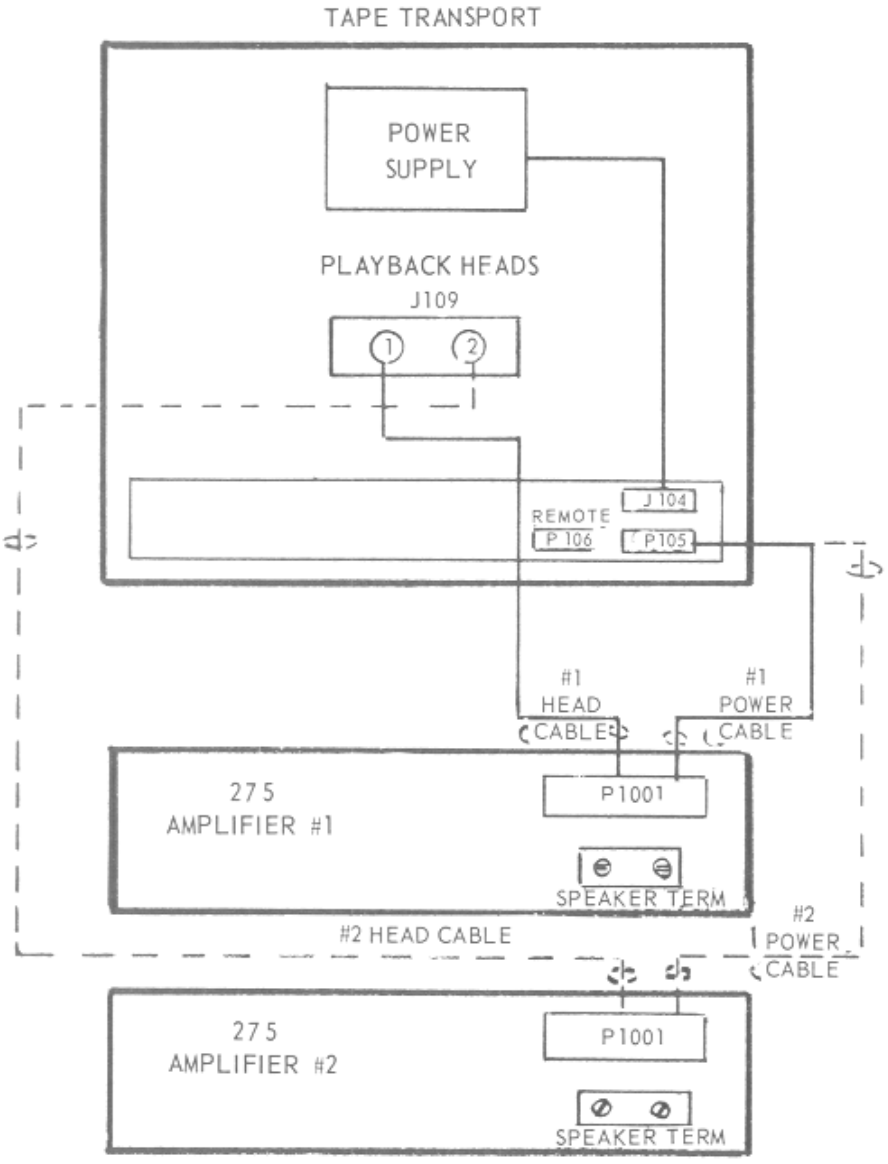


Figure 6C-1. Interconnecting Cabling, Model 275

6C2.6. INPUTS

There are no inputs other than recordings on magnetic tape.

6C3. OPERATING INSTRUCTIONS

The operating controls on the Model 275 are identical to those of the Model 280 with the exception of the omission of the RECORD switch (S106) and Record lamp (DS102). These have been replaced by a recessed monitor jack and a monitor gain control. All other operating instructions in section 3 of this manual are applicable to the Model 275.

6C4. TAPE TRANSPORT

Except for Record functions and the description of the head assembly, the coverage in section 4 of this manual applies to the Model 275. There are no record functions and the head

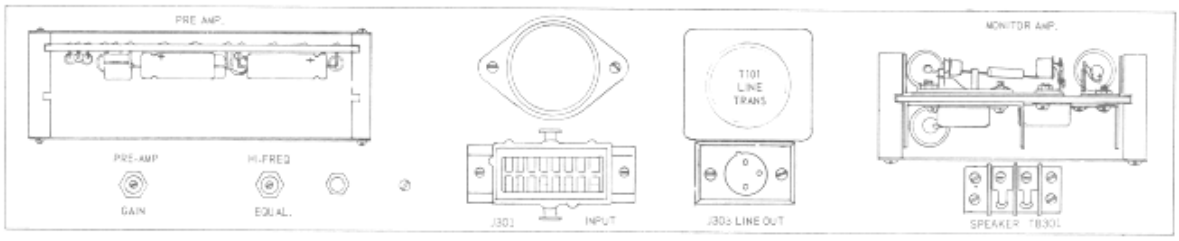


Figure 6C-2. Electronics Assembly Panel, Model 275

assembly is equipped with only one active head, which is used for playback. This playback head is identical to the basic Model 280 playback head described in section 4. Also provided with the Model 275 head assembly are two dummy heads.

6C5.1. ELECTRONICS ASSEMBLY
(See figure 8-14.)

The electronics assembly of the 275 Reproducer is a self-contained 3-1/2" x 19" x 10" deep chassis. Included in this unit are a preamplifier, preamplifier gain, high-frequency equalization adjustment, preamplifier output, interconnecting provisions, and a power amplifier. A maximum preamplifier output of +18 dbm is available from the male XLR connector on the chassis. See figure 6C-2.

6C5.2. PLAYBACK PREAMPLIFIER

The playback preamplifier is a two-section, five-stage audio amplifier. The signal from the playback head, after high-frequency equalization, passes through the first-section stages. These employ local feedback for gain stability, distortion reduction, and playback equalization. The signal then travels from the "preamp gain" control to the second or line section of the amplifier. This portion of the amplifier contains three stages: (1) a grounded emitter stage, (2) an emitter follower to provide a drive for the complementary push-pull output transistors, and (3) an output transformer and feedback network. The signal from the output transformer feeds the LINE OUT jack, the power amplifier, and the headphone monitor.

6C5.3. POWER AMPLIFIER

The power amplifier is a solid-state, plug-in module capable of supplying three watts of power into an 8- or 16-ohm speaker (speaker not provided).

All voltage gain from this amplifier is derived from Q1001. From this point on, the current gain is provided by Q1002 - Q1005, which are connected as a standard symmetrical quasi-complementary output stage. Each of these output transistors is mounted on its own heat sink, thus providing the maximum thermal resistance. With this, the best possible operating-point stabilization at high ambient temperatures results. It should be observed that neither of these heat sinks can be grounded. The upper transistor (Q1002) sink has a DC operating potential of 20-30 VDC. The heat sink of the lower output transistor Q1004 has a voltage equal to one-half that of the other heat sink, Q1002 ±2 VDC.

To insure minimum distortion of low-level signals, the output stage is operated as a class AB amplifier. The quiescent collector current at the output stage is normally 100 to 200 ma. This can be checked by observing a voltage drop of 0.1 to 0.2 volt across the 1-ohm resistor R1001.