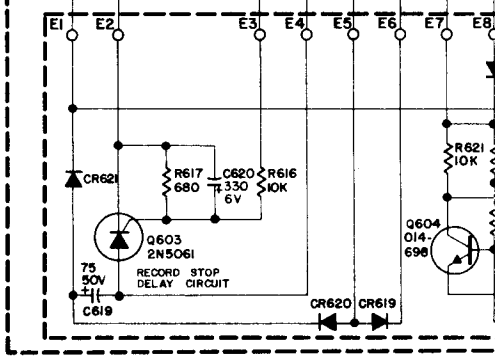


- NOTES UNLESS OTHERWISE SPECIFIED
1. ALL RESISTOR VALUES ARE IN OHMS, 1/2 WATT, 10%.
  2. ALL CAPACITOR VALUES ARE IN MICROFARADS, AT INDICATED VOLTAGE.
  3. ALL DIODES ARE TYPE O13-678.
  4. FOR FIELD SERVICE ONLY:  
 Q601 MAY BE 2N3638.  
 Q604 & Q605 MAY BE 2N3117 OR 2N3565.  
 Q606 MAY BE 2N3055.

LAST DES.	REF. USED
B603	S611
C621*	T602
CR622	
DS601	
E13	
F603	
J607S	
K610	
P607P	
Q606	
R625	
REF. NOT USED	DES. USED
CR607	
CR610	
J604S	
P601P	
P604P	



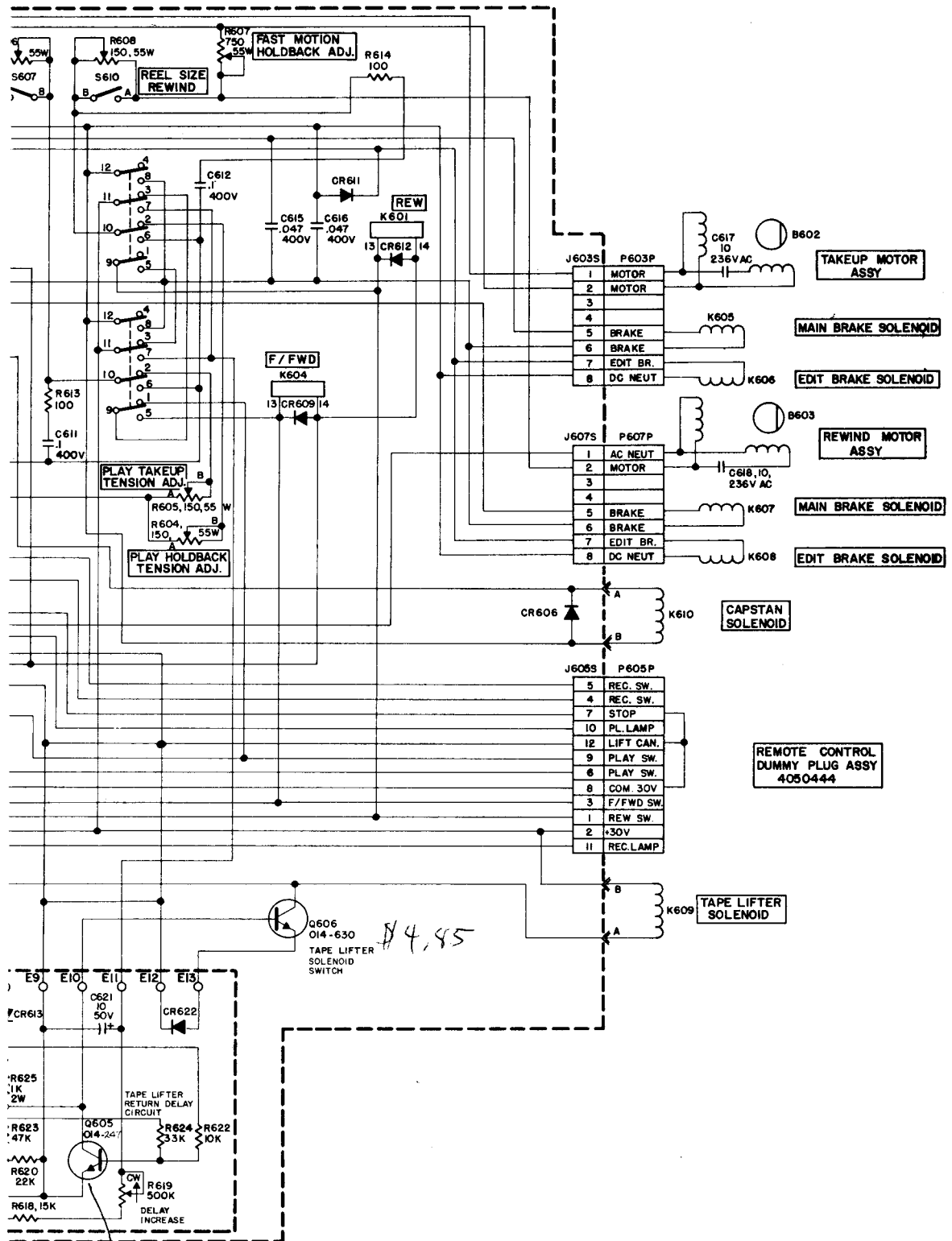


Fig. 6-20. Schematic Diagram, Transport

238  
2  
47c

### 5.1.6 Tape Lifter

A solenoid-operated tape lifter assembly raises the tape from contact with the heads during fast-forward or rewind operation. When either mode starts, the solenoid K609 energizes and moves the tape lifter mechanism. The tape lifter is defeated as long as the edit pushbutton is pressed. The tape lifter may be manually defeated by opening the head gate and pushing the right-hand tape lifter arm to the retracted position.

In the fast forward or rewind mode the tape-lifting arms do not retract instantly when the stop button is pressed. An electronic delay is provided so that the tape stops completely before contacting the head, which avoids the high-peak signal that results from the moving recorded tape contacting the heads.

The delay circuit for the record-stop function involves terminals E1 through E6 on the small circuit board in the control box.

The play relay circuit's negative side is connected through SCR Q603 to the power supply. During the play mode, pressing the STOP button causes Q603 to stop conducting and switch the play relay off. During the record mode, the record-relay holding current passes through Q602 (base to emitter) causing it to conduct the power supply voltage through E5 and CR620 to charge capacitor C619. When the STOP button is pressed, the capacitor discharges through CR621 into the play relay coil to hold the relay on for 1/4 second after Q603 de-energizes. Therefore, the time delay occurs only when the STOP button is pressed during the record mode.

The sole function of capacitor C620 is to maintain a charge to turn on Q603 when the play relay is actuated.

The sole function of diode CR619 is to block negative flowing current from interfering with delay of the relay.

In addition, when the tape is stopped in the record mode, the control logic assumes that the tape "coasts" about 250 milliseconds before stopping. This allows the tape-biasing rf current to completely decay before tape motion ends, which avoids the loud noise that results from the tape

stopping while bias current is still present in the record head.

The delay circuit for the tape-return-to-head function involves terminals E7 through E13 and Q606 on the small circuit board in the control box.

When the transport isn't in the re-wind mode, no voltage appears at E11 so the two-transistor flip-flop circuit has Q604 non-conducting and Q605 saturated. Power appears at E11 when the FAST FWD or REWIND button is pressed, which reverses the transistor states to turn on power transistor Q606 resulting in tape lifter actuation, to lift the tape from the heads.

When either fast wind mode is stopped, the tape lifter is held from the play position by the discharging of capacitor C621 through the adjustable potentiometer R619. The time delay for returning the tape to head-contact can therefore be set by adjusting R619.

### 5.1.7 Control Circuit

#### 5.1.7.1 Play Mode

When tape is correctly threaded and power is applied, the capstan rotates at the speed selected at the speed switch. Pressing the PLAY pushbutton then results in the following circuit action:

Play relay K602, in the 24-volt dc circuit, is energized. Contact set 1-9-5 of that relay completes a holding circuit across the play pushbutton. Contact set 2-10-6 applies ac power (through the tension-adjust resistors) to the takeup and rewind supply motors. Contact set 3-11-7 completes the 115-volt dc energizing circuit to the capstan idler solenoid. Contact set 4-12-8 connects 115-volt dc to energize the supply and takeup main brake solenoids. Thus the brakes release, the turntable motors operate, and the tape (pressed against the rotating capstan) is driven at the selected speed.

#### 5.1.7.2 Fast-Forward Mode

The negative return for fast-forward, rewind, and edit relays is through transistor Q601, which must conduct to allow those modes to actuate

(refer to record mode, paragraph 5.1.7.5).

With power on and tape threaded, pressing the FAST FWD pushbutton energizes fast-forward relay K604. Contact set 1-9-5 of that relay opens the 24-volt dc circuit to the play circuit, and closes a holding circuit across the fast-forward switch. Contact set 2-10-6 connects full ac power to the takeup motor (reel switch in large hub position) and reduced ac power (through resistor R607) to the rewind motor. Contact set 3-11-7 opens the 24-vdc circuit to the rewind relay, and closes the 24-vdc circuit to tape-lifter solenoid K609, through edit switch S611. Contact set 4-12-8 conducts the 115 vdc to energize main-brake solenoids K605 and K607. The takeup motor therefore operates at full torque, the rewind motor at reduced torque; tape is lifted from head contact, the brakes are released, and the tape winds from the rewind to the takeup reel.

#### 5.1.7.3 Rewind Mode

The negative return for the rewind, fast-forward, and edit relays is through transistor Q601, which must conduct to allow those modes to actuate (refer to record mode, paragraph 5.1.7.5).

With power on and tape threaded, pushing the REWIND pushbutton energizes rewind relay K601. Contact set 1-9-5 completes a holding circuit across the rewind switch. Contact set 2-10-6 connects full ac power to the rewind motor (reel switch in large hub position), and connects reduced ac power (through resistor R607) to the takeup motor. Contact set 3-11-7 breaks the 24-vdc circuit to the play and fast-forward circuit and connects 24-vdc to tape-lifter solenoid K609. Contact set 4-12-8 connects 115 vdc to energize main-brake solenoids K605 and K607. Thus, the rewind motor operates at full torque, the takeup motor operates at reduced torque, the brakes are released, tape is lifted from contact with the heads, and tape rewinds from the takeup reel to the supply reel.

Tape lifter action in the rewind mode, as in the fast-forward mode, can be defeated by pressing the EDIT pushbutton.

#### 5.1.7.4 Edit Modes

The negative return for the edit, rewind, and fast-forward relays is through transistor Q601, which must conduct to allow those modes to actuate (refer to record mode, paragraph 5.1.7.5).

When the edit relay is energized in either the stop/edit or the play/edit mode, contact set 1-9-5 completes a holding circuit across the edit switch. Contact set 2-10-6 opens the 115 vdc circuit to the takeup main brake solenoid and closes the 115 vdc circuit to the takeup and supply edit brake solenoids. Contact set 3-11-7 opens the 24 vdc circuit to the record switch, locking out the record mode. Contact set 4-12-8 opens the ac circuit to the takeup motor and closes a shorting circuit across the safety switch to bypass the switch.

In the stop/edit mode, therefore, the safety switch is shorted and the low braking force (supplied by the edit brake solenoids) makes it easy to manually turn the reels. In the play/edit mode, the safety switch is shorted, the record mode is locked out, ac power is removed from the takeup motor, the supply brake is fully released (by the supply main brake solenoid), and the takeup turntable is held by the takeup brake solenoid action; therefore the takeup turntable will not rotate, and tape will spill off the right side of the transport.

The edit relay is not energized in the fast-winding/edit mode. This mode simply defeats the tape lifting mechanism while the edit pushbutton is depressed during fast-forward or rewind operation. This opens the negative return lead to the tape lifter solenoid, which remains de-energized as long as the pushbutton is held down; therefore tape will contact the heads, and monitoring is possible.

#### 5.1.7.5 Record Mode

To initiate the record mode, the tape is placed in motion in the play mode, and then the record pushbutton pressed to energize the record relays.

When any record relay is energized, as shown in Fig. 6-21, contact set 4-12-8 of that relay makes a return connection to the transport.