

FIELD ENGINEERING BULLETIN

TITLE: SERVO ALIGNMENT PROCEDURE

I. APPLICABILITY

All ATR-100's.

II. PURPOSE

To align capstan and reel servos in the ATR-100 Recorder/Reproducer.

III. DISCUSSION

The ATR-100 servo system is aligned at the factory and should not require adjustment unless any of the LED or sensor PWAs are replaced or disturbed. Removal of the tach PWAs does not generally result in the necessity to readjust the capstan tach if the screw holding the adjustment bar is not disturbed. Adjustment of the capstan servo is usually required if any of the following symptoms are present.

1. Capstan does not stop on command.
2. Capstan does not lock at one or more speeds.
3. Tape timer counts randomly up and down at high speed.
4. Capstan runs away at a high speed.
5. Low speed flutter out of spec.

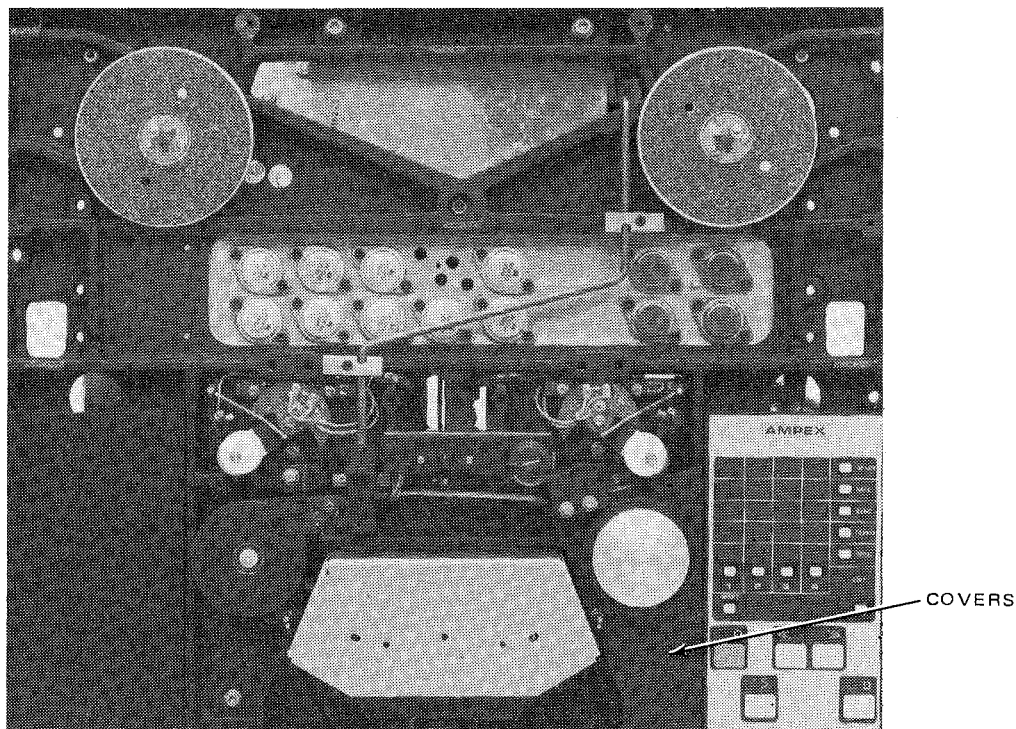
Adjustment of the reel servo is usually required if any of the following symptoms are present.

1. Tape tension incorrect.
2. Tape tension not balanced (capstan coasts unequally forward and reverse).
3. Capstan comes out of lock or fails to lock.
4. ATR-100 does not enter thread mode smoothly.
5. ATR-100 does not stop or does not stop quickly at end of tape.
6. Tape moves in stop mode.
7. Tape moves in play-edit stopped mode.
8. Flutter out of spec.

IV. PROCEDURE**A. Capstan Servo Alignment Procedure**

1. With power off, remove reel servo PWA.
2. Place capstan servo PWA on extender.
3. Remove covers over the front side of the capstan tachometer assembly (refer to Figure 1).
4. Loosen both screws holding tach sensor assembly (refer to Figure 2).

TITLE: SERVO ALIGNMENT PROCEDURE



13843-2

Figure 1. Front Covers

5. Apply power and place ATR-100 into play mode. If capstan runs away, turn off power and re-apply power. Do the next three steps by manually turning the capstan.
6. Monitor TP5 and TP6 of the capstan servo PWA with dual trace scope (set for chop mode).
7. Move sensor tangentially for maximum indication on scope (refer to Figure 2).
8. Adjust R32 and R50 on the capstan servo PWA for 15Vp-p.

NOTE:

Waveform appearing at TP6 will not be sinusoidal but will have a distortion near the zero crossing. This is due to the hysteresis introduced into one preamplifier.

9. Monitor TP3 and TP4 of the capstan servo PWA.
10. Move tach sensor radially for a 90° phase difference in the two signals (refer to Figure 2).
11. Press stop button. If capstan stops, go to step 13; if capstan runs away, go to step 12.
12. Move tach sensor radially for a 90° phase difference in the opposite direction to that observed in step 10 above.

TITLE: SERVO ALIGNMENT PROCEDURE

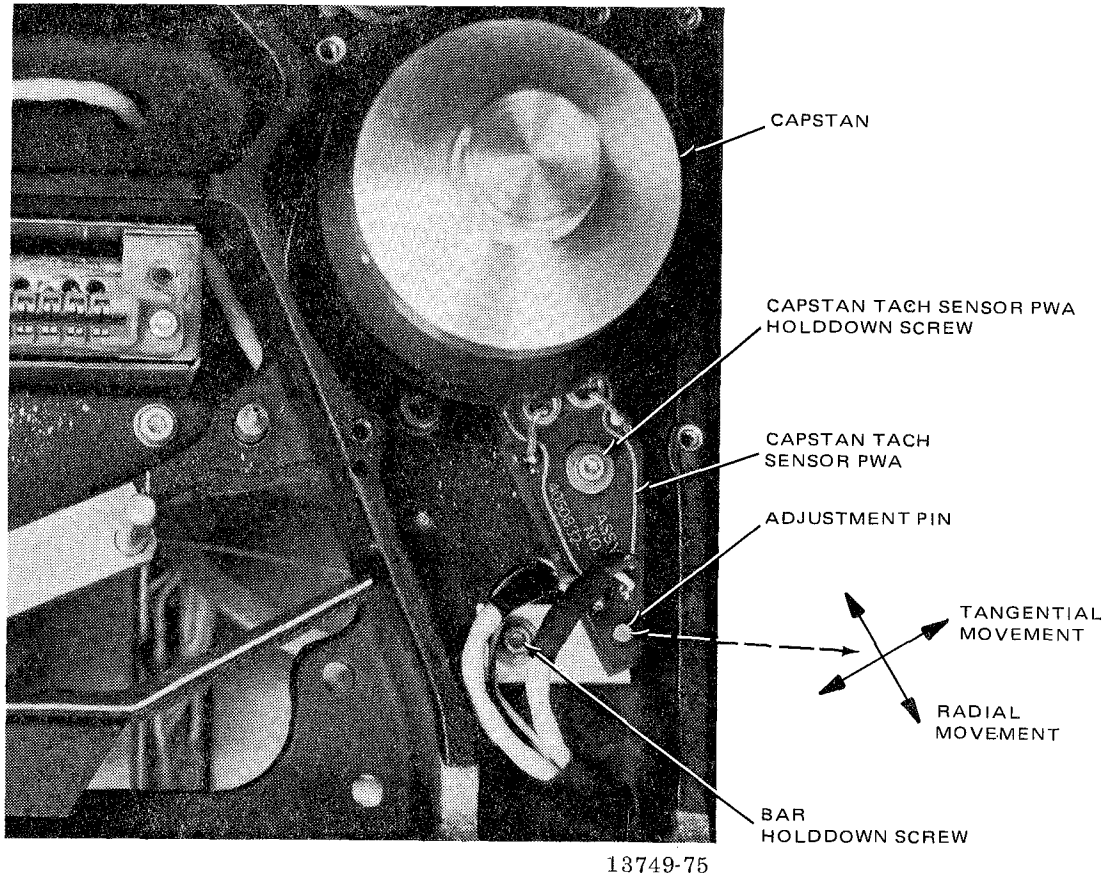


Figure 2. Tach Sensor PWA

13. Place transport in fast forward; observe that phase angle may change, but that it should never reverse or have two transitions of one signal without a transition of the other appearing in between.
14. Press stop button and check that transport stops.
15. Place transport in fast rewind; note that the phase angle should be the same as in step 13 above, but in the opposite direction. Move sensor *slightly* to satisfy this condition.
16. Press stop button and check that transport stops.
17. Place transport in fast forward. While observing scope, tighten first the screw on the bar, then the one on the PWA, noting that the phase does not change appreciably. (Refer to Figure 2.)
18. Test adjustment by placing transport in rewind.

TITLE: SERVO ALIGNMENT PROCEDURE

19. Replace tach covers.

NOTE:

In later production machines, the tach PWAs may be removed and the same ones replaced (required to remove capstan) without disturbing this adjustment as long as the screw on the bar is *not* loosened.

20. Turn off power.

B. Reel Servo Alignment Procedure

1. Return capstan servo PWA to its normal position (in chassis) and place reel servo PWA on extender.
2. Ensure that tape thread microswitches on supply and takeup tension arms can be activated with all overlays in place and secured.
3. Apply power.
4. Monitor TP5 of reel servo PWA with scope.
5. Move both supply and takeup constant tension arms to their mid positions. Indication should be high (+5V).
6. Let either arm go; indication should be low (0V).
7. Repeat for the other arm with the first arm at mid position. Indication should be low (0V).
8. Monitor TP6 of reel servo PWA with scope. Indication should be high (+5V).
9. Move either arm in towards heads. Indication should be low (0V).
10. Repeat for other arm.
11. If logic conditions required in steps 6 through 11 are not met, adjust appropriate LED PWA on tension arm by loosening mounting screw slightly and rotating PWA relative to the tension arm. Retest with overlay in place.
12. Thread tape on the transport and activate servos.
NOTE:
A squealing sound usually results and is of no concern.
13. Advance tape to mid pack (equal tape pack on each reel).
14. Place transport in play at 15 in/s.
15. Measure tension between reproduce head and capstan with a "Tentelometer." If Tentelometer is available, go to step 17; if not, go to step 16.
16. Measure voltage at TP7 of reel servo PWA.
17. Adjust R125 on reel servo PWA for 3.75-oz reading on the Tentelometer (-330 mV on the voltmeter) when using 1/4-inch tape, or a 7.5-oz reading on the Tentelometer (-440 mV on the voltmeter) when using 1/2-inch tape.
18. Press stop button.

AMPEX**PROFESSIONAL
AUDIO DIVISION****FIELD ENGINEERING BULLETIN**REF. NO. 70181
MODEL ATR-100
PAGE 5 OF 5
SUPERSEDES
DATE OF ISSUE 1/27/77

TITLE: SERVO ALIGNMENT PROCEDURE

19. Spin edit knob equally in each direction; note that tape should coast approximately equal distances in each direction. Adjust R128 for this condition.
20. Place transport in play edit; then stop. If capstan does not stop, verify steps 17 through 19.
21. Turn off power.
22. Return PWAs to normal position.
23. Apply power.
24. Recheck tensions.
25. Recheck capstan servo lock.