

## Adding slow-start capstan to an Ampex 350/351/354/AG-350

Author: David Dintenfass Date: Wednesday, May 26, 2010

**DISCLAIMER: Modify your machine at your own risk.**

One nice feature of the Ampex 300 and the 3200 duplicators (and their clones) is having the option of a slow-start capstan. In this mode, the capstan motor does not start until you press play. This reduces tape spillage at high tape speeds (30 ips or higher) as the takeup motor gets chance to start winding tape before the capstan spins up—which normally causes the safety/tension switch to turn off (which consequently stops the transport).

This feature is not available on 350/351/354/AG-350 transports as it isn't necessary at speeds of 15 ips or lower AND because the relay logic on the 300 transport is different than that used on the smaller machines.

I recently added this feature to an Accurate Sound duplicator clone which uses a control box similar to the Ampex 350/351/354/AG-350 control box.

All you do is find a 120 Vdc relay, preferably one with fairly robust contacts. All you need is one set of contacts, but most relays you are likely to find will have two sets minimum, typically with both normally-open and normally-closed contacts. You can mount the relay to the side of the control box in an empty space across from K502 (the play relay).

One example would be the Tyco/P&B type KA-11DG-110  
(<http://www.tycoelectronics.com/catalog/products/en?q=KA-11DG-110>).

Don't use a miniature relay (like the type used in the Ampex 440 and later machines); use something fairly large, with 10A contacts. Since it's difficult to find surplus open-frame relays these days, I just used a plastic-cased Potter & Brumfield 110 Vdc relay with a 10K coil resistance and an octal plug. I disassembled the housing and just used the relay itself. This appears to be the same relay used in the above mentioned type KA-11DG-110.

BTW, the relays used in the Ampex control box are typically 5K dc coil resistance, and given that the control box is supplying most of its current to the pinch-wheel solenoid and the brake solenoids, the additional 10K load across the play relay isn't going to cause a significant current drain.

Connect the slow-start relay coil across the relay coil of **K502** (the play relay). You will need to unscrew K502 to gain access to the coil contacts (solder carefully). Once this is done, both relays will operate when you press play (the latching is provided by the K502 wiring so there's no need to wire the slow-start relay with its own latching circuit).

Make a cut in the wire connecting **pin 14** of the Jones socket marked **J501S Transport Control** and **pin 8** of the Jones socket marked **J503S 60 Cycle Amplifier**. Splice one set of the NO (normally-open) relay contacts in your added relay into this circuit path. In other words, there is now a connection from pin 14 of J501S through the NO contacts of the slow-start relay to pin 8 of J503S.

Usual disclaimers, modify at your own risk, avoid exposure to high voltages, fitness for your application not guaranteed, etc. This modification has only been tested on the old-style control box used with Ampex 350/351/354/AG-350 and similar clone machines.

Also note that this modification will keep the machine in slow-start mode UNLESS you add a toggle switch to short the NO contacts of the slow-start relay (shorting the contacts will revert the machine back to stock start behavior).

-dave