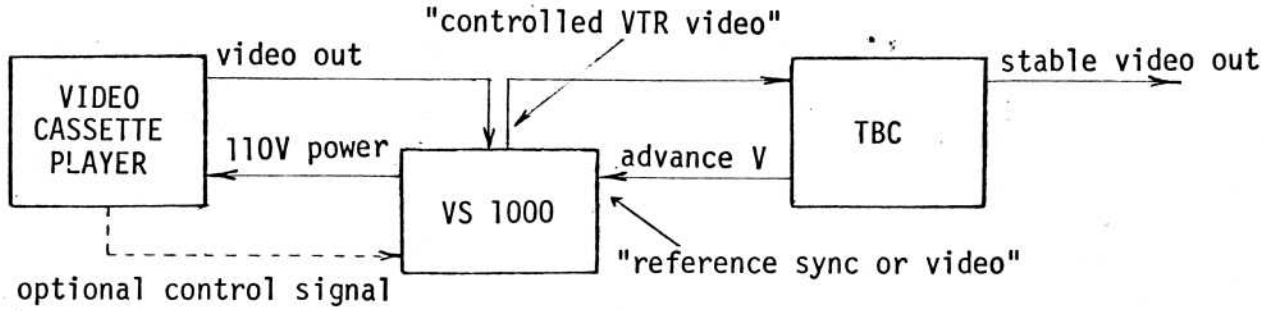
INSTRUCTIONS

for

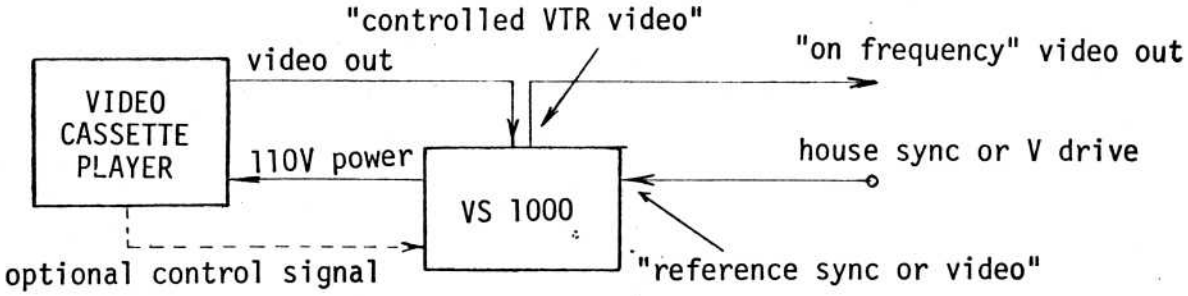
VS 1000

April 1976

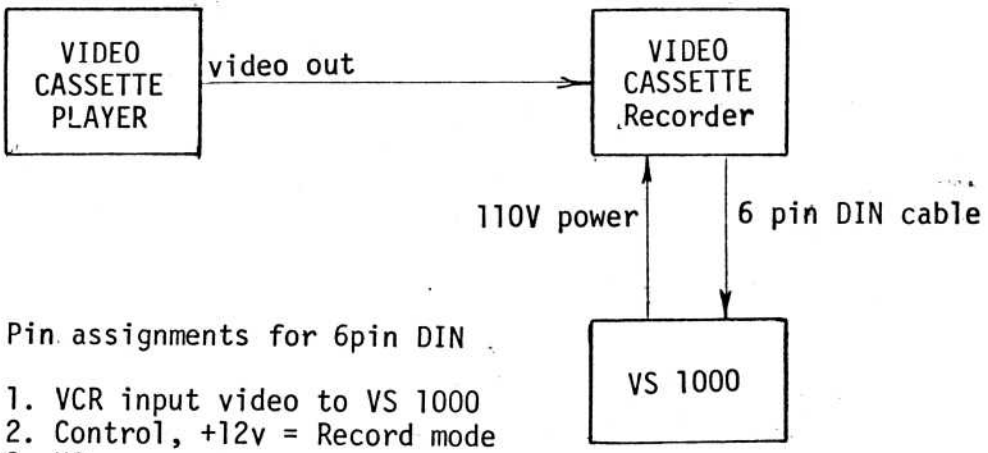
BASIC HOOK-up With TBC



BASIC HOOK-UP Without TBC



BASIC HOOK-UP Editing



Pin assignments for 6pin DIN

1. VCR input video to VS 1000
2. Control, +12v = Record mode
3. NC
4. Control, +12v = Play mode
5. VCR Playback video to VS 1000
6. Enables control functions when grounded

Shell - Must be connected to pin 6

CONTROLS

Panel Switches

POWER on-off: Instantly turns on all VS 1000 functions except its 110 V output to power VCR. There is a 30 second delay before output power is available.

PRESET-SERVO: In PRESET mode the VS 1000 is a fixed frequency power source, there is no servo action. The output frequency is accurate enough to properly operate any VTR/VCR.

MONITOR-DISPLAY: Affects only the MONITOR output. In the DISPLAY position it adds REFERENCE SYNC to the VTR playback video creating a display of the VTR speed and stability.

Lamps

PILOT: Lights anytime VS 1000 is turned on.

INPUT: Lights when either or both video (or sync) inputs are missing.

PRESET: Indicates when the VS 1000 is in the PRESET mode (i.e. no servo action). This is automatic if one or both inputs are missing. A modified VCR will set the PRESET mode whenever it is not in the PLAY mode.

LOCK: Lights whenever the servo is more than ± 1.5 lines out of lock. (The LOCK PHASE control shifts this detector along with the lock phase.)

Adjustments Behind Door

LOCK PHASE: Adjusts the relationship between tape playback and reference sync or video.

FREQUENCY: Useful only in the PRESET mode (except for set-up testing). This allows a speed change of approximately ± 5% from nominal (± 3 cps at 60 cps). It is useful with AF recorders and establishing lip sync between recorders.

Test Points Behind Door

REFERENCE GROUP: Derived from REFERENCE input.

VIDEO: Buffered low pass filtered video.

SYNC: TTL compatible stripped composite sync.

SQUARE: 60 cps square wave, rise triggered by vertical sync.

ADVANCE: 60 cps negative pulse. Fall is 5 lines before vertical sync, rise triggered by vertical sync.

VTR GROUP: Derived from CONTROLLED VTR VIDEO

VIDEO: As above.

SYNC: As above.

SAMPLE: Servo sample pulse. 30 μs positive pulse approximately 15 lines after vertical sync.

NOT GROUPED

MONITOR: Same as MONITOR output at rear panel.

ERROR: Phase detector error voltage. Normally at +5v d.c. Varies at the rate of 180 mv. per line of error.

TEST BUTTON: Causes a 2 line change in lock phase when held in. Used for checking servo/VCR set-up.

SET-UP

1. Make a 15 minute recording on the VTR or VCR to be used with the VS 1000. Power the VTR from the local power line not the VS 1000.

2. Set the VS 1000 switches as follows: MONITOR, PRESET, OFF.

3. Feed the video output of the VCR to the VS 1000 CONTROLLED VTR VIDEO (either connector, they loop through).

4. Feed house sync to the REFERENCE SYNC or COMPOSITE VIDEO connector (another loop through).

   Note on 3 & 4: The 6 pin DIN connector can supply these signals from the VCR, if the VCR is so equipped.

5. Hook up a monitor to the MONITOR connector.

6. Turn on VS 1000 - the PILOT, LOCK and PRESET lights should come on and the output of the VCR should appear on the monitor. If either the house sync or CONTROLLED VTR VIDEO is not present, the INPUT light will light.

7. Play back the tape made on that VCR, still powered from the local power line.

8. Set switch to DISPLAY. This will add house sync to the output of the VCR on the monitor, causing a display of VCR video stability and frequency compared to house sync. The frequency should be close since the tape was just recorded. Study the speed changes, jitter, etc.

9. Unplug VCR from the local power line and plug into the POWER FOR VTR outlet.

10. Again play the tape. A similar display should result, but there may be some speed difference due to the servo output being at a slightly different frequency than the local power line.

SETTING OF THE RESPONSE TIME

1. Open the door by turning the knob 1/4 turn counterclockwise.

2. Start with the very slow setting of LOW PASS = 9, GAIN = 2.5, RATE = 0, and DAMP = 0.

3. Power the VCR from the servo.

4. Set switches as follows: MONITOR, PRESET, ON.

5. Set VCR to play.

6. Set monitor switch to DISPLAY after a picture appears.

7. Verify that VCR is running close to proper speed (i.e. more than 3 sec for the vertical blanking to roll through the picture).

8. Set servo to the SERVO position. The VCR should slowly v-lock. Its jitter and random speed changes will be apparent.

9. Push TEST button and hold in. The picture will slide sideways about 2 lines (if this isn't enough to plainly see, set LOCK PHASE fully clockwise and pull out, the test jump will now be 5 lines). Release TEST button after picture comes to rest.

   a. If at any time the servo should get far off speed, it may be rapidly brought back to 60 cps by the following:

      i. Set to PRESET.
      ii. Rotate LOW PASS to zero and hold for 1-2 seconds.
      iii. Return LOW PASS to previous setting.
      iv. Correct whatever made it go off speed.

10. Alternately push TEST (hold in until picture comes to rest, then release) and advance GAIN CONTROL about 1 division at a time until overshoot is apparent. Back off to the point where there is little or no overshoot. The idea is to advance it to the fastest point without overshoot. Do not be confused by the natural back and forth motion of the VCR output.

11. Using the same procedure gradually reduce LOW PASS until overshoot is apparent (this time overshoot is very slow). Set as low as possible without overshoot.

12. This setting will keep a good VCR within a $\pm 1\frac{1}{2}$ line window, but a good safety factor makes a faster action desireable.

13. Alternately push TEST and advance RATE as you did with GAIN. This will speed up the response to your jump. Advance it until some oscillation becomes apparent on the jump. Set it for the fastest response without oscillation.

14. Repeat for DAMP control (here the oscillation will be very fast and may appear as jitter). Here you may notice a rapid jump followed by a slower drift in the same direction. In that case advance GAIN to eliminate this slower portion of the jump. A rapid jump followed by very slow overshoot indicates that the LOW PASS is set to low.

15. If required, the LOW PASS can be reduced at this time to counter slow drifting of VCR. Once again avoid overshoot. A good test at this point is as follows:

    a. Set to PRESET.
    b. Pull out FREQUENCY adjust and adjust manually to set tape vertical about 1/3 way down from top of screen.
    c. Push off FREQUENCY.
    d. Set to SERVO. This will show lock-up behavior and will indicate how far you can reduce the LOW PASS.

16. The final result should be a response that, when tested, will jump rapidly and come to a smooth rapid stop without overshoot or jitter. This is a good setting for general purpose TBC use.

17. The VS 1000 can be adjusted for a wide variety of response characteristics. The foregoing should be considered a quick way to get a good set up for any one VTR, not the only useable method or settings. Some other responses are noted below.

18. Bad tapes or VTR's may require advancing all controls slightly to get minimum peak to peak drift in order to stay inside a window. This is best done by watching the stability display while slowly advancing GAIN, RATE, DAMP and retarding LOW PASS.

19. Conversely to play tapes without a TBC (i.e. to give interlaced color off of all tapes) over a cable system or for dubbing, it is desireable to guarantee that there is no increase in jitter by reducing the response speed to the point of zero overshoot or slower. This is mostly true of the RATE and DAMP controls as they can increase jitter if advance too far. It should be noted that some TBC's will let through some jitter. Dropouts can affect the lock. A slow response is very immune to dropouts.

20. Slow settings are very stable in the long term, while fast settings become a critical balance, and will drift as VCR warms up, etc.