

CHANGE NOTICE

This change is to be collated into manual no. 1809927-10 dated, JUNE 1969

Superseded pages are to be destroyed.

AMPEX

1809927-11

Inter-Sync^{*} Model 1021
Solid State Television
Signal Synchronizer
Operation and Maintenance Manual

ISSUED: APRIL 1965
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SECTION II

ALIGNMENT

5.2-1 GENERAL

5.2-2 This section contains the alignment procedures for the Intersync servo system after it has been installed in a videotape recorder. Inter-system wiring between the Intersync servo and the electronic editor is shown in Figure 5.2-12, and drawings 1212338, 1385205, 1385206 and 1385326 of Chapter 6.

NOTE

The following corrective maintenance procedures are applicable for an Intersync servo unit installed in a recorder system which does not contain built-in monitoring facilities. For recorder systems containing monitoring facilities (i. e., VR-1200 with optional monitor bridge, VR-1200B, VR-2000B), the maintenance procedures for the Intersync servo system may differ in certain instances; when this occurs, use the procedures outlined in the technical manuals of these recorder systems.

5.2-3 TAPE TRANSPORT ALIGNMENT

5.2-4 Tape transport alignment should be made by establishing the proper operating torques for the reel motors, adjusting the reel motor brake tensions and setting the pinch-roller-to-capstan pressure. Procedures for checking the tape transport can be

found in the instruction manual for the videotape recorder.

5.2-5 INTERSYNC SERVO SYSTEM MONTHLY ALIGNMENT

5.2-6 To ensure optimum performance of the Intersync servo system with any videotape television recorder, the procedure outlined below should be performed after each month of operation of the equipment. The only tools and test equipment needed to perform the monthly alignment are a small, slot-type screwdriver and a Tektronix 541 (or equivalent) oscilloscope. To ensure the accuracy of tests performed, the oscilloscope should be regularly maintained and calibrated as is consistent with good laboratory practices. Also, the oscilloscope and the unit under test should be warmed up a minimum of 30 minutes prior to actual testing. To perform the monthly alignment procedures, proceed as follows:

- a. Connect the unit to external power.
- b. Connect an external sync generator to the EXT SYNC IN connector on the videotape recorder
- c. Turn the recorder power on.
- d. Set E-E/TAPE switch on the main control panel to e-e position.
- e. Set the SERVO MODE control on the recorder main control panel to PRESET.

f. Place the **PLAYBACK-PRE-SET REFERENCE SELECTOR** switch on the Intersync servo control panel to **EXT**. Place the **REC PRESET REFERENCE SELECTOR** to **VIDEO**.

g. Set the **TRACKING** switch on the main control panel at **HOMETRACK**.

h. Trigger an oscilloscope from **TP1 REFERENCE PULSES** (on the panel of pwb 2).

NOTE

Reference to the various boards in this procedure pertain to the modular printed wiring boards (pwb) contained in the Intersync servo chassis. The pwb identifying numbers are located at the upper left corner of each board's front cover overlay plate. Corresponding numbers are also placarded on the chassis to properly locate each module in its respective mounting position in the chassis.

i. Check that the signals at **TP2 REFERENCE SYNC**, and **TP4 TYPE SYNC** (on the panel of pwb 1) are locked to the oscilloscope trigger reference pulse

NOTE

External sync should be from the same generator that is providing sync to the video signal.

j. Place the **TAPE H TRIGGER** switch on the connector panel at the middle, lower rear of the unit in the **EXT** position. Check for tape horizontal trigger at **TP1 TAPE HOR TRIGGER** on the panel of pwb 1.

NOTE

This signal is the horizontal trigger from either the signal system, the Amtec accessory, or the processing amplifier, in order of preference (i. e., if the first is not available then use the second; if the second is not available then use the third).

k. With the drum motor off, observe the drum oscillator frequency at **TP4 DRUM PHASE 3** on pwb 7. Adjust **R21 DRUM OSC FREQ 525** (or **R20 DRUM OSC FREQ 405/625/819** for 50 Hz systems) on panel of pwb 6 for a stationary or slowly drifting display.

l. Turn **EE-HEAD ON TAPE-HEAD ON** switch to the **HEAD ON** position in **e-e** mode. Turn the **DISCR** switch on the meter panel at the center of the servo chassis to **REF**. If the meter does not indicate within the white center zone, adjust **R28**, pwb 2, to enter the meter. (Use **R29** for 405, 625, or 819 line standards.) Turn the **DISCR** switch on the servo meter panel to **TACH**. The drum should be locked to the reference syncs indicated by a stationary display at **TP4**, pwb 7, and the servo motor should indicate within the white center zone. If either condition is not met, adjust **R61**, pwb 3, (**R62** for 405, 625, or 819 line standards) to lock the drum and center the meter.

m. Adjust **R20 CAPSTAN OSC FREQ** (on the panel of pwb 13), or **R78 CAPSTAN OSC FREQ 405/625/819** or 405, 625, and 819 line standards, to obtain a stationary or slowly drifting capstan frequency at **TP4 CAPSTAN PHASE 2** or **TP5 CAPSTAN PHASE 1** (on the panel of pwb 13).

n. Initiate Record mode. Turn the **DISCR** switch on the servo meter panel to **CAPST**. The capstan oscillator should be locked to the video sync and the meter should indicate within the white center zone. If either condition is not met adjust **R1**, pwb 12. (**R2**

on 405, 625, or 819 line standards) to lock the capstan oscillator and center the meter.

o. Continue Record mode. Simultaneously observe the waveforms at TP4 TACH SIG, pwb 3, and the video input to the modulator, if possible. If the video input is not accessible, observe the video signal as early in the system as possible. The signal at TP4, pwb 3, should be locked to the video sync and a positive-going edge of the tach squarewave should align with the third vertical serration of the vertical sync pulses. (64 microseconds following the vertical pulse trailing edge on French 819 line systems.) If not, adjust R84 TACH PHASE ADJ 525 on pwb 3 (R1 TACH PHASE ADJ 405/625/819 for 405, 625, and 819 line systems) to obtain this result.

NOTE

Video signals observed near the output circuits of the system may be delayed several microseconds from the input. If it is necessary to observe a delayed video signal in the preceding step, the tach phase may be adjusted in advance of the point indicated, by an amount equal to the delay, provided the delay can be determined.

p. With the head drum off, thread a reel of blank tape on the transport, then record a video signal.

NOTE

Both the head drum and capstan signals should be locked to the reference sync.

q. While recording the video signal, observe the waveform at TP1 CONTROL TRACK RECORD CURRENT on pwb 10. Adjust R1 CONTROL TRACK RECORD LEVEL

CONTROL, (on the panel of pwb 9) to obtain a sine wave of approximately 1.5 Vp-p. Ascertain that frame pulses are present.

r. Stop recording and initiate playback mode. Observe the waveform at TP2 CONTROL TRACK UNFILTERED PLAYBACK (on the panel of pwb 10). Optimum recording is obtained when the record current just reaches saturation. (Saturation can be observed as a slight inflection at the zero crossing of the playback signal.) If the indicator is not optimum, repeat the recording and adjust R1, pwb 10, for optimum level. Repeat until recording is optimum.

s. Record a video signal for five minutes.

t. Play back the recorded signal and adjust the tracking as follows:

1. Set the TRACK SELECTOR to HOMETRACK.
2. Observe the waveform at TP6 CONTROL TRACK FILTERED PLAYBACK (on the panel of pwb 11).
3. Adjust R79 CONTROL TRACK PLAYBACK LEVEL (on the panel of pwb 11) to obtain a 10 Vp-p sine wave. (Check that both the head drum and capstan are phase-locked to the reference sync.)
4. Adjust the TRACKING control for maximum indication on the TRACKING-RECORD CURRENT meter, or for maximum RF amplitude of the switcher output as convenient.

5. Set the TRACK SELECTOR to each of its four track positions (HOMETRACK 1, 2, 3, and 4); only a slight change in the indications should be observed between the various track positions.

u. While the recorder is still in the playback mode, set the SERVO MODE switch at NORM and check for normal servo operation.

v. While the recorder is still in the playback mode, set the SERVO MODE switch at VERT. Within several seconds, the VERT LOCK indicator above the SERVO MODE switch should illuminate.

w. Check the sync signals at TP4 TAPE SYNC and at TP2 REFERENCE SYNC (on the panel of pwb 1); the vertical pulses at the two test points should be in time coincidence within ± 10 microseconds. If not, adjust R72 VERTICAL LOCK PHASE (on panel of pwb 1) to obtain this result.

NOTE

The VERT indicator of the DRUM COMPARATOR indicator group, on the Intersync servo control panel, must be illuminated to make the adjustment at R72.

x. Turn the HORIZONTAL STABILITY controls 1 and 2, on the Intersync servo control panel to their three o'clock positions, and set the SERVO MODE control on the main control panel at AUTO.

y. Start the playback mode; within a few seconds both the VERT and HORIZ LOCK indicators on the main control panel should illuminate.

z. Check the signal at TP1 HOR PHASE ERROR, on module 4 and adjust both HORIZONTAL STABILITY controls to obtain the straightest and most noise-free line possible.

aa. Switch the SERVO MODE control alternately between AUTO, HORIZ, and VERT. Each LOCK indicator (VERT or HORIZ) should illuminate when the SERVO MODE control is in the appropriate position.

NOTE

The VERT LOCK indicator may illuminate at times when the SERVO MODE control is at some position other than VERT. Both the VERT and HORIZ LOCK indicators should illuminate when the SERVO MODE control is at AUTO.

ab. Observe the playback picture on the monitor with the SERVO MODE control set to AUTO. The picture should lock up in approximately three seconds.

5.2-7 SWITCHER CHECKOUT PROCEDURE (VR-1100 ONLY)

4.2-8 The frequency of the switcher is checked in accordance with the following procedure:

a. Turn the system on, and allow a 30 minute warm up period.

b. Set the EE/TAPE switch to TAPE.

c. Set the oscilloscope for a sweep of 1 usec/division and trigger it from the power line.

d. Place the oscilloscope probe to TP2 on pwb 3. The display must be a 960 Hz sawtooth waveform, approximately 5 Vp-p in amplitude for 60 fields-per-second (fps) system, and 1000 Hz at the same amplitude for 50 fps systems.

NOTE

If the switcher frequency is not correct, refer to VR-1100 video television recorder instruction manual for adjustment procedures.