AMPEX

1809990

Model 1090 Automatic Velocity Compensator (VR-1200 Series Recorders)

Operation and Maintenance Manual

AMPEX

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Operation and Maintenance Manual

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LIST OF EFFECTIVE PAGES

Page	Issue Date
Title Page	Original
A	Original
i thru xiii/xiv	Original
1.0-1 thru 1.0-3/4	Original
1.1-1 thru 1.1-2	Original
1.2-1 thru 1.2-2	Original
2.0-1 thru 2.0-3/4	Original
2.1-1/2	Original
2.2-1/2	Original
INST 1 thru INST 20	Original
3.0-1/2	Original
3.1-1/2	Original
4.0-1 thru 4.0-3/4	Original
4.1-1 thru 4.1-3/4	Original
4.2-1 thru 4.2-10	Original
5.0-1 thru 5.0-3/4	Original
5.1-1/2	Original
5.2-1 thru 5.2-21/22	Original
6.0-1 thru 6.0-6	Original
6.1-A thru 6.1-23/24	Original
6.2-A thru 6.2-96	Original

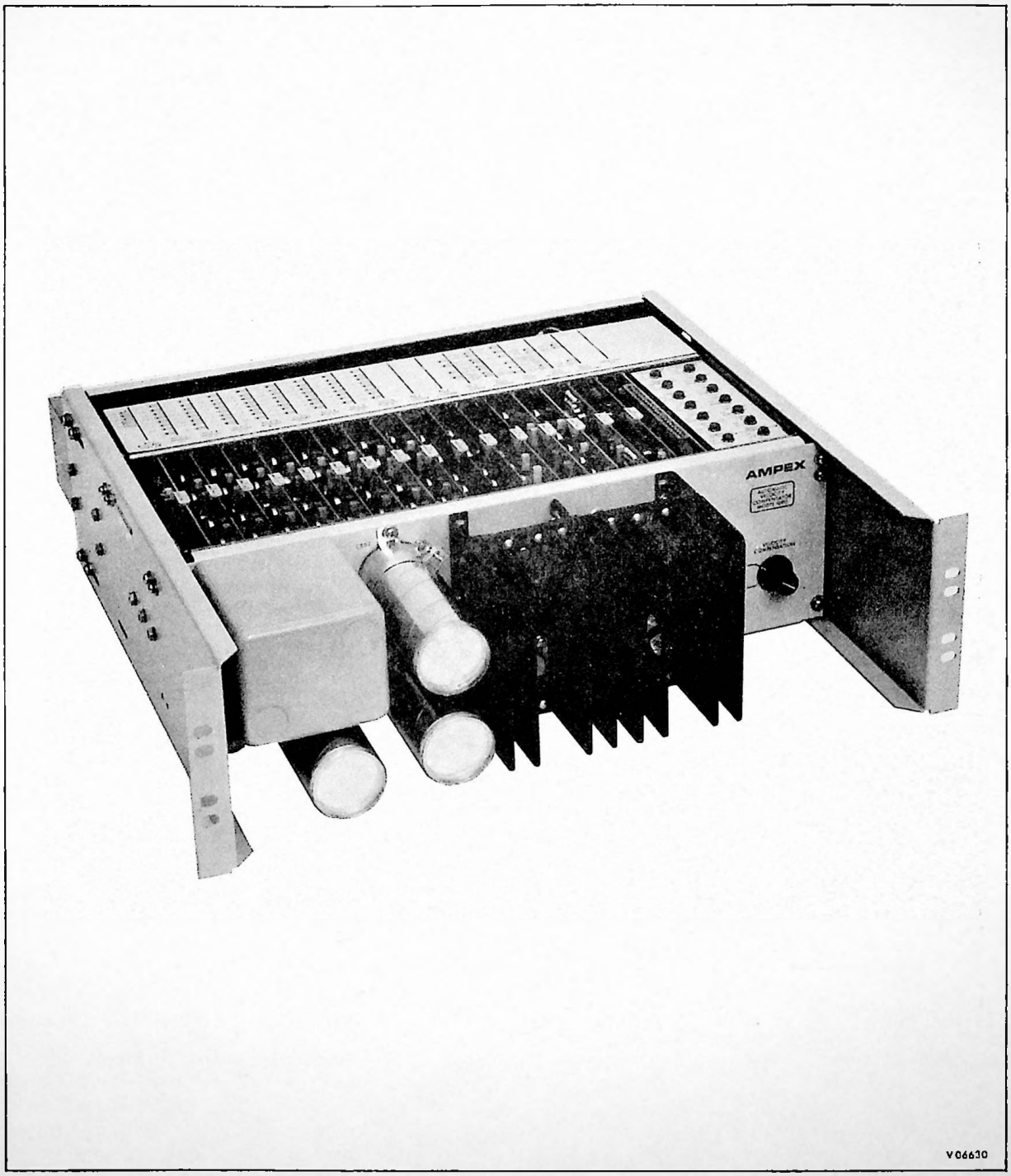
Issue

NOTICE

Only proper use will produce the high performance and reliability for which your Ampex equipment was designed, built, and tested. In order to be sure that you obtain the best possible performance and reliability, please DO NOT:

- INSTALL or CONNECT,
- OPERATE,
- ADJUST or ALIGN,
- MAINTAIN, or
- REPAIR

the equipment without first consulting the applicable portion(s) of the manual.



Model 1090 Automatic Velocity Compensator

IMPORTANT

AMPEX FIELD ENGINEERING BULLETIN SERVICE

Ampex provides a continuous Technical Support program for its products. This program is implemented through Field Engineering Bulletins which are published by the Ampex Technical Support Group. Approved modifications, information on special tools and accessories, and improved operating and maintenance techniques are typical of the information distributed in these bulletins.

This service is offered without charge and is extended to all end users of Ampex Equipment. If you are not receiving Field Engineering Bulletins at this time you will be placed on the mailing list upon receipt of the following information:

1. The Ampex Model Number of your equipment,
2. The Final Equipment or System Serial Number,
3. Your Company name and complete mail address,
4. The person or department to whom the bulletins should be directed.

Mail the above information to:

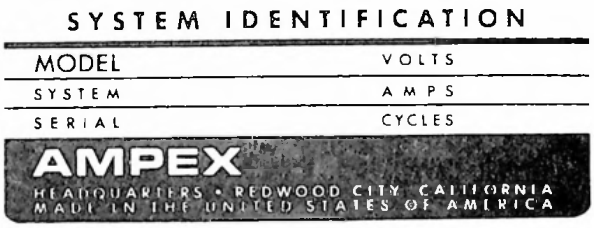
Ampex Corporation
P.O. Box 5000
Redwood City, California
U.S.A.

Attn: Technical Support Group
M.S. 4-10

Note this service is world wide.

COMMUNICATING WITH AMPEX FOR SERVICE AND REPLACEMENT PARTS

Your Ampex equipment is identified by a red System Identification nameplate. Our Parts and Service Department maintains a record of your equipment according to the numbers shown thereon. The nameplate will appear in the form illustrated below.



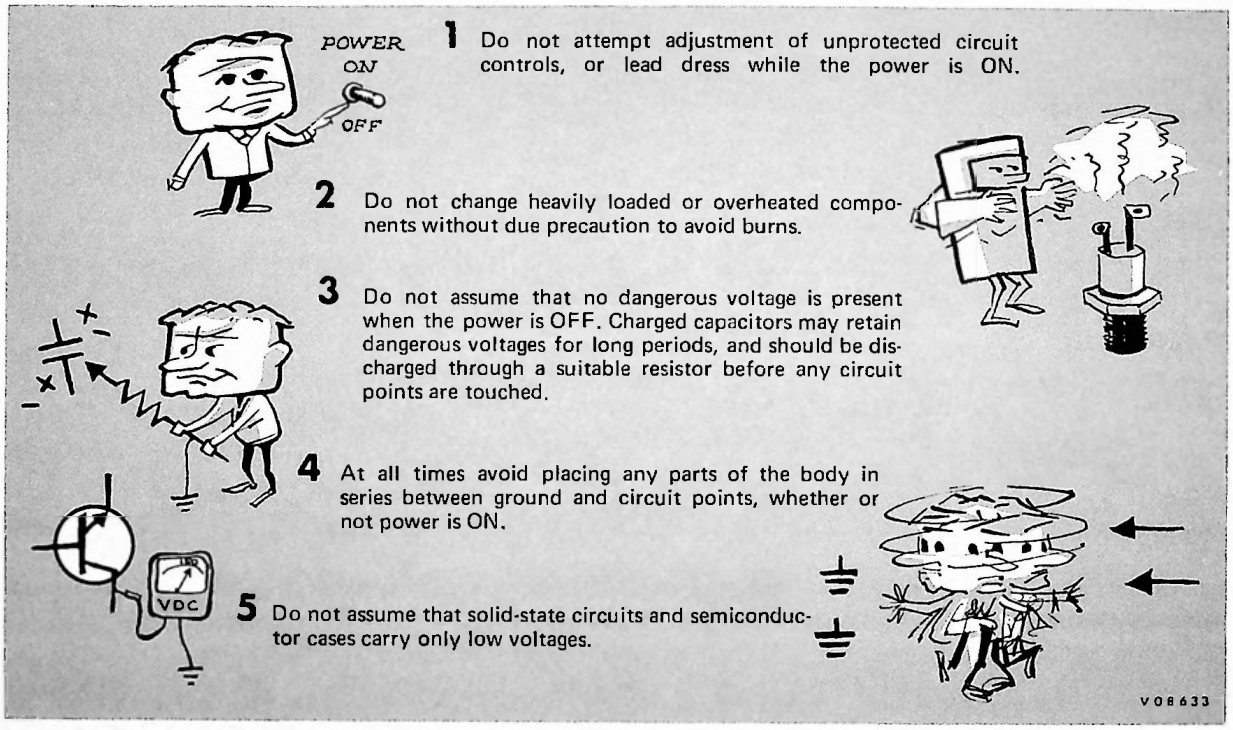
When requesting service and replacement parts, please identify your equipment by the information shown on this nameplate, being careful to include the model number, system number, and serial number.

The term cycles, and the abbreviations cps, kc, and Mc will be noted variously on the nameplate, placarding, and drawings. All narrative within this manual, however, will express frequencies in Hertz, employing the abbreviations Hz (Hertz), kHz (kilohertz), MHz (megahertz), and GHz (Gigahertz).

SAFETY & FIRST AID

Because personnel working with electronic equipment are exposed to the hazard of high voltage, it is imperative that all safety regulations be consistently observed, and that each individual has a clear understanding of basic First Aid methods.

The following typical hazards must be avoided at all times:



For their own protection, and the protection of others, all electronic personnel should become thoroughly familiar with the approved First Aid treatment of burns and shock. There are three principal degrees of burns, recognizable as follows:

1. A first degree burn reddens the skin
2. A second degree burn blisters the skin
3. A third degree burn chars the flesh and frequently places the victim in a state of shock accompanied by respiratory paralysis.

Respiratory paralysis in the victim can cause death within seconds, by suffocation. For this reason it is imperative that the approved method of artificial respiration be initiated immediately and continued until the victim's breathing is normal.

A muscular spasm or unconsciousness may render the victim unable to free himself of the electric power. If this is the case, turn the power OFF immediately.

CAUTION

DO NOT TOUCH HIM, OR YOU MAY SHARE HIS PREDICAMENT.

If the power cannot be turned OFF immediately, very carefully loop a dry rope, article of clothing, length of strong cloth, or a rolled-up newspaper around the victim and pull him free of the power. Carefully avoid touching him or his clothing.

The moment he is clear of the power, place him in a reclining position, cover him with a blanket (or newspapers) to keep him warm, and begin artificial respiration. At the first opportunity, enlist help in the summoning of a doctor. If a doctor cannot be summoned, transport the victim to the doctor, infirmary, or hospital. Be sure that the victim is kept well covered and warm while awaiting professional aid and treatment.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS (Continued)

LIST OF TABLES

INTRODUCTION TO THE MANUAL

This manual provides information required for operation and field-level maintenance of the Model 1090 Automatic Velocity Compensator. Information pertaining to special equipment applications or factory-level maintenance is not included.

The manual is divided into six chapters. The first five chapters cover description, installation, operation, theory of operation, and maintenance. The sixth chapter contains schematic and wiring diagrams, installation drawings, and lists of materials. The table of contents provides a more detailed outline of each chapter.

As a convenience, the body of Chapter 2 (Installation) has been designed to be stored separately or disposed of if not needed. This disposable portion of the chapter has been printed on blue paper for purposes of identification.

CHAPTER 1

GENERAL INFORMATION

INTRODUCTION

This chapter comprises two sections. The first identifies the equipment and provides pictures of it, the second provides a list of specifications.

SECTION I

EQUIPMENT IDENTIFICATION

1.1-1 The Model 1090 Automatic Velocity Compensator (Figures 1.1-1 and 1.1-2) is an accessory to the VR-1200 Videotape Television Recorder. The velocity compensator, operating in conjunction with the Colortec* and Amtec* accessories, reduces residual time-base errors caused by variations in record/playback head-to-tape speeds. The unit is automatic, with no operating controls other than a velocity compensation OFF/ON

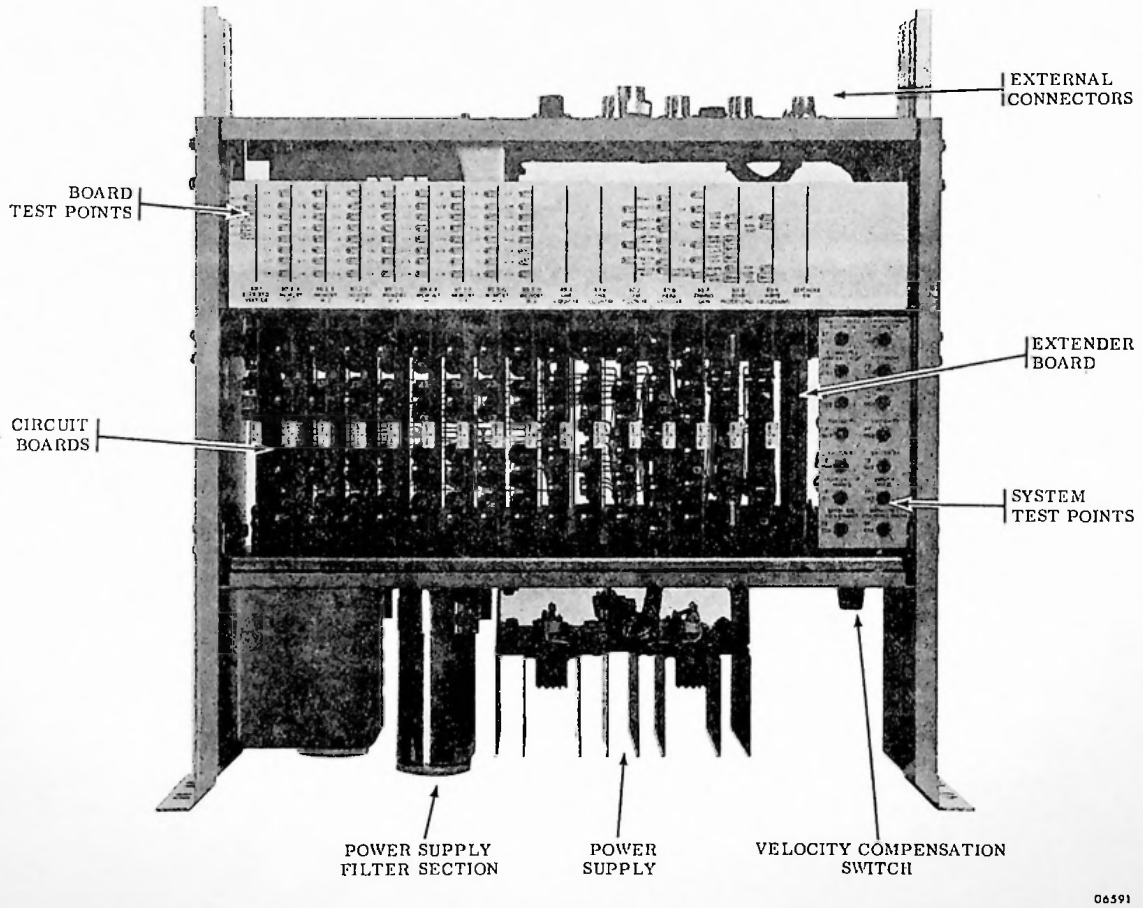
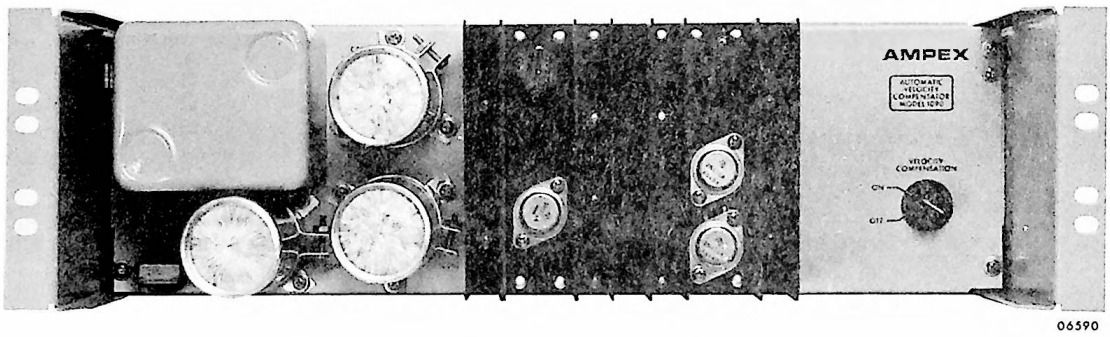


Figure 1.1-1. Model 1090 Automatic Velocity Compensator

*Trademark, Ampex Corporation

switch. A more detailed functional description can be found in Chapter 4 of this manual.

1.1-2 An internal power supply provides all operating voltages. Seventeen plug-in boards carry all circuitry for the unit, including integrated gates and flip-flops. External connections for the Amtec and Colortec accessories are located at the rear of the chassis.



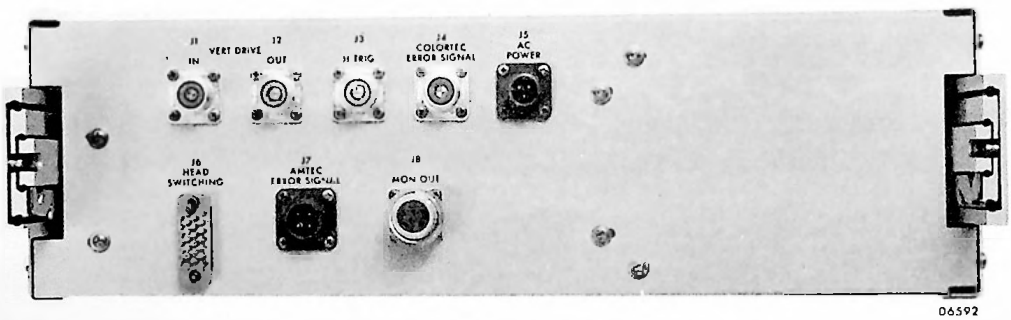


Figure 1.1-2. Model 1090 Automatic Velocity Compensator Front and Rear View

SECTION II

SPECIFICATIONS

The general specifications of the Model 1090 Automatic Velocity Compensator are given in Table 1.2-1. Because of possible design improvements or equipment modifications, all specifications listed in this section are subject to change without notification.

Table 1.2-1. List of Specifications

CHARACTERISTIC	SPECIFICATION
Physical:	
Height	5-1/4 in. (13 cm)
Width	19 in. (48 cm)
Depth	19 in. (48 cm)
Weight	39 lbs (17.6 kg)
Environmental:	
Operating Temperature	0 to 55°C
Power Requirements:	
Power Input	117 Vac 70W max
Frequency	50 or 60 Hz
Input Signals:	
Amtec Error	1.8 Vp-p (±5%), max, centered at -2.15 Vdc
Colortec Error	1.0 Vp-p (±5%), max, centered at -1.0 Vdc

Table 1.2-1. List of Specifications (Continued)

CHARACTERISTIC	SPECIFICATION
Input Signals (Continued)	
Amtec "H" Trigger (Input)	4 to 8 Vp-p neg from a 75-ohm source 1 to 3 Usec wide; leading edge coincident with Amtec video sync. Terminated in 75 ohms (±1%).
Vertical Drive (Input)	3 to 5 Vp-p neg from a 75-ohm source in the processing amplifier into high impedance bridging
Switch #1 Switch #2 Switch #3 Switch #4	Head switching waveforms from video signal system
Head Switch Time	Negative pulse from video signal system occurring every TV line. Leading edge containing information relevant to head switch time.
Switch Pulse	Negative pulse from video signal system. Trailing edge coincident with actual head switch.
Output Signal:	
Amtec Corrected Error	Amplitude and dc level equal to Amtec error input (±1%)
Performance:	
Total Range of Correction	1 Usec during a given head pass
Line-to-Line Correction	0.2 Usec max
Total Remaining Velocity Error	Max of ±3° of color subcarrier, referenced to burst
Line Standards	525 or 625

CHAPTER 2

INSTALLATION

INTRODUCTION

Chapter 2 comprises two sections. The first contains a brief statement concerning unpacking the unit, and the second provides installation instructions.

SECTION I

UNPACKING

No special techniques are required to unpack the velocity compensator. Parts received should be checked carefully for shipping damage and compared with the list of materials in Chapter 6 to determine that none are missing.

SECTION II

SITING AND INSTALLING THE EQUIPMENT

2.2-1 This section contains a set of separate procedures for installing the 1090 velocity compensator in the VR-1200, VR-1200A, and VR-1200B recorders. In order to make your manual easier to use, it is suggested that you initially discard the procedures that do not apply.

NOTE

The post-installation procedure at the end of the set should be retained by all users, since it must be performed at the conclusion of either set of installation instructions.

2.2-2 After you have completed the installation in your recorder, the procedure(s) for it may be moved to the back of the book, stored separately, or discarded, if desired. This will not disrupt the page numbering or invalidate any references.

2.2-3 The following list gives the page numbers of the various procedures in the set.

NOTE

Illustration numbers in the set of procedures run in a continuous sequence. As a result, unless the procedure you retain is the first of the set, the illustration numbers will not start with 1.

INSTALLATION OF MODEL 1090 VELOCITY COMPENSATOR IN VR-1200 RECORDER

NOTE

If an electronic editor unit is included in the VR-1200 console, the velocity compensator must be mounted externally. In this event, contact the Ampex field service engineer and obtain a custom external mounting kit and special instructions before proceeding with the installation.

NOTE

This installation is accomplished with material furnished in kit no. 1805184-05.

1. SIGNAL SYSTEM MODIFICATION IN VR-1200 RECORDER

Modify the signal system chassis as instructed below before installing the velocity compensator chassis.

a. Disconnect all cables from signal system connectors and remove the signal system chassis from the recorder.

b. Drill two 0.171-inch diameter holes in right side of signal system chassis as shown in Figure 1).

c. Mount connector J23 of kit-furnished harness 1351798-01 at two holes drilled in step b (see Figure 2).

d. Route leads of harness 1361798-01 along original wiring harness at rear of signal system chassis, and make the following solder connections (if necessary, refer also to drawing 1361798).

1. Solder center conductor ofcoaxial cable from J23-A to J008-11.
2. Solder shield of coaxial cable from J23-C to ground bus of J008.
3. Solder center conductor of coaxial cable from J23-K to J012-17.
4. Solder shield of coaxial cable from J23-M to ground bus of J012.
5. Solder anode lead of diode CR6 to J015-4 (cathode connected to J23-N).
6. Solder anode lead of diode CR7 to J015-5 (cathode connected to J23-T).
7. Solder anode lead of diode CR8 to J015-6 (cathode connected to J23-X).
8. Solder anode lead of diode CR9 to J015-7 (cathode connected to J23-BB).

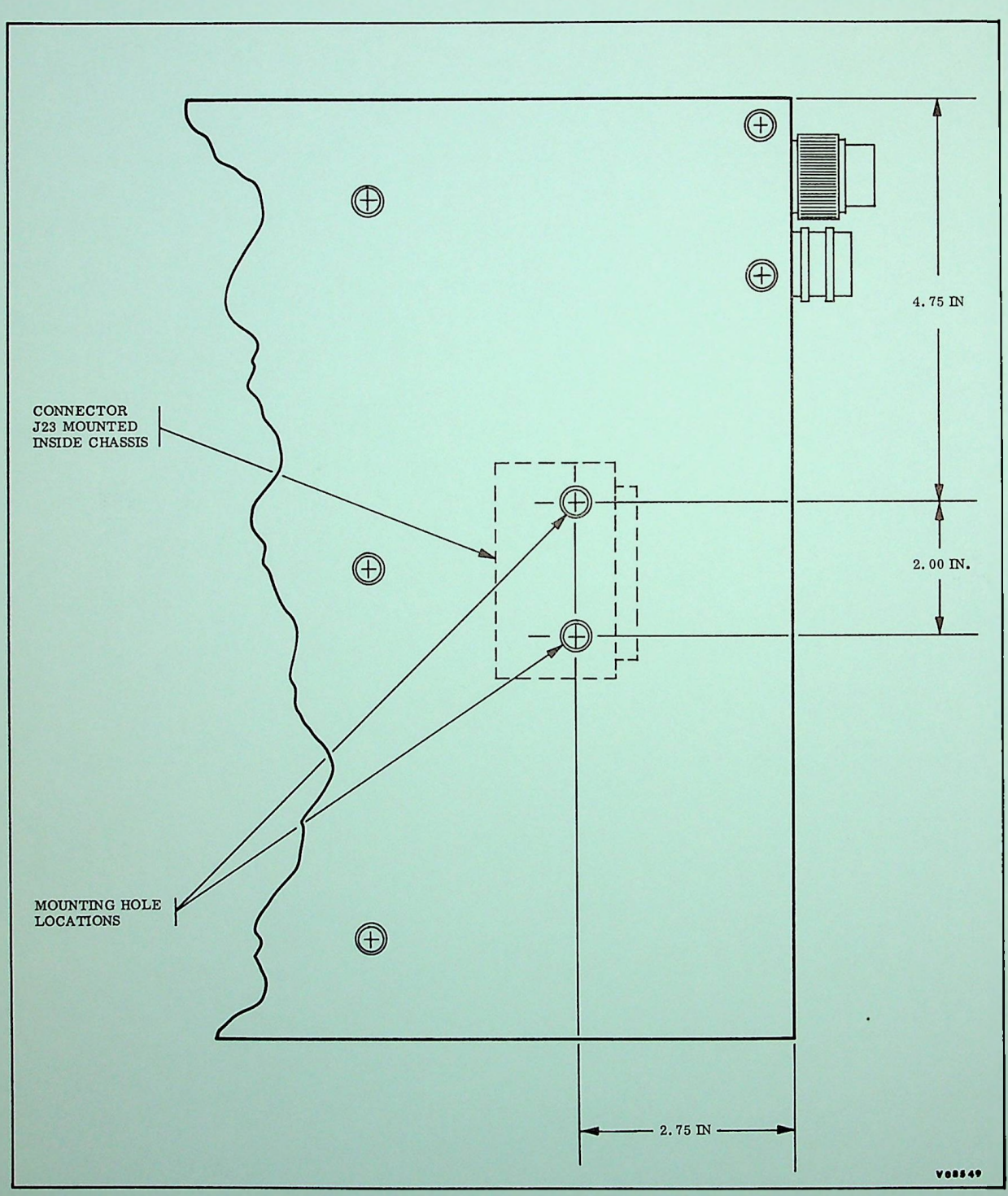


Figure 1. VR-1200 Signal System Modification - Connector Mounting

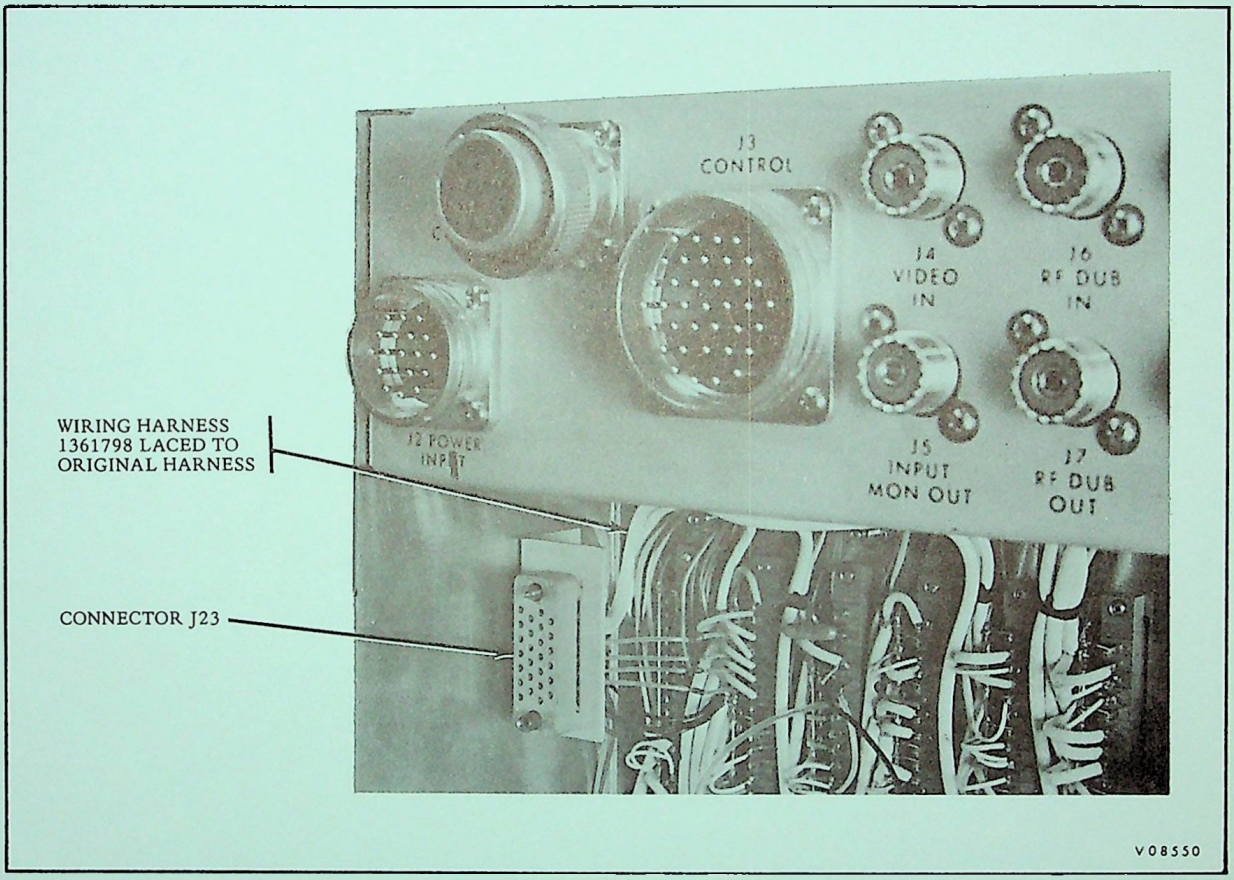


Figure 2. VR-1200 Signal System Modification, Harness Installation

9. Solder lead from J23-DD to ground bus at J015.

10. Solder lead from J23-Y to J014-7.

11. Solder lead from J23-CC to J008-9.

e. Lace new harness to original harness.

f. Reinstall signal system chassis in recorder, and reconnect all cables disconnected in step a.

2. AMTEC UNIT MODIFICATION IN VR-1200 RECORDER

Modify the Amtec unit as instructed below before installing the velocity compensator.

a. Disconnect all cables from Amtec connectors and remove Amtec chassis from recorder.

b. Remove the shielded lead connecting K001-9 and board 6, pin U.

c. Remove connector J7 and associated lead to board 13 pin 5 from Amtec chassis.

d. Mount connector of kit-furnished harness 1360415-01 in J7 position.

e. Route the three leads of harness 1360415-01 along main harness, through grommet and hinge brackets and along front of chassis. Lace new harness to original harness.

f. Make the following solder connections:

1. Solder conductor of coaxial cable from J7-C to board 6, pin U.

2. Solder shield of coaxial cable from J7-C to ground bus at board 6.

3. Solder conductor of coaxial cable from J7-B to board 13-E5.

4. Solder shield of coaxial cable from J7-B to ground bus at board 13.

5. Solder conductor of coaxial cable from J7-D to K001-9.

6. Solder shield of coaxial cable from J7-D to ground lug at K001.

7. Unsolder jumper between pins M and T of board 6.

8. Solder separate jumpers from pins R, S, and T of board 6 to ground bus of board 6.

g. Remove board 6 from the Amtec chassis, and replace it with kit-furnished board 1360008.

h. Reinstall Amtec chassis in recorder, and reconnect all cables disconnected in step a.

3. EXTERNAL MOUNTING OF VELOCITY COMPENSATOR FOR VR-1200 RECORDER

If an electronic editor unit is included in the VR-1200 rack, the velocity compensator must be mounted externally. It is recommended that an Ampex field service engineer be consulted for details of equipment location and mounting. A custom set of interconnecting cables must be obtained to suit the specific equipment location. After installing the chassis, proceed to paragraph 5, VR-1200 Interconnections. Paragraph 4 applies only to velocity compensators mounted in the VR-1200 console.

4. RACK MOUNTING OF VELOCITY COMPENSATOR FOR VR-1200 RECORDER

If the recorder to be modified is not equipped with an electronic editor unit, install the velocity compensator in the lower left mounting position of the VR-1200 rack as instructed below.

a. Remove the door from the left hand bay of the VR-1200 cabinet.

b. Remove the bottom door hinge from the left hand bay.

c. Remove the 8-inch blank panel installed at the bottom mounting position of the left hand bay. Save the mounting hardware for re-use.

d. Assemble kit-furnished chassis support brackets, part no. 1361186, to the kit-furnished left- and right-rear chassis supports, part nos. 1361800 and 1361799.

e. Install the left- and right-rear chassis supports vertically along the sides of the bay inside the cabinet.

f. Insert the velocity compensator in the bottom left mounting position, using mounting hardware from step c. Install kit-furnished blank panel, part no. 1360061, below the velocity compensator. Reinstall the door hinge removed in step b at this time, since the hinge shares mounting holes used by the velocity compensator and blank panel. Chassis rails on the velocity compensator should extend through the chassis support brackets on the chassis supports installed in step e.

g. Install kit-furnished VELOCITY label 1361794, over the WAVEFORM MONITOR selector position previously labelled SPARE.

h. Reinstall the door removed in step a.

5. VR-1200 INTERCONNECTIONS

Install kit-furnished interconnecting cables from the velocity compensator to other units of the recorder as instructed below.

NOTE

If the velocity compensator is mounted outside the VR-1200 rack, disregard the cable designation and dimensions in the following steps, and use equivalent cables furnished in the custom external mounting kit.

a. Connect cable 1361795-01 from velocity compensator connector J1 to Colortec connector J13.

b. Connect cable 1361795-02 from velocity compensator connector J2 to signal system connector J8.

c. Connect cable 1361795-03 from velocity compensator connector J3 to Amtec connector J4.

d. If Colortec unit is model 1012, connect cable 1361796-01 from velocity compensator connector J4 to Colortec connector J16. If the Colortec unit is a Model 1011, connect cable 1361796-01 as follows:

1. Disconnect cable from Colortec connector J8.

2. Mount kit-furnished tee adapter to kit-furnished elbow adapter, and install elbow adapter on Colortec connector J8.

3. Reconnect cable disconnected in step 1 to one receptacle of tee adapter at Colortec connector J8.

4. Connect cable 1361796-01 from velocity compensator connector J4 to the vacant receptacle at Colortec connector J8.

e. Connect cable 52596 from velocity compensator connector J5 to the ac power duct of the recorder.

f. Connect cable 1361793-03 from velocity compensator connector J6 to signal system connector J23.

g. Connect cable 1361797-01 from velocity compensator connector J7 to Amtec connector J7.

h. Connect cable 1361792-01 as follows:

1. Connect cable connector to velocity compensator connector J8.

2. Route cable along existing cable runs to vicinity of monitor bridge accessory unit.

3. Disconnect connector P9 from J9 on the waveform monitor.
4. Disassemble P9 as necessary to gain access to the pins.
5. Solder connector of cable 1361792-01 to pin 16 of P9.
6. Solder shield of cable 1361792-01 to pin 17 of P9.
7. Reassemble P9 and reconnect it to waveform monitor connector J9.

INSTALLATION OF MODEL 1090 VELOCITY COMPENSATOR IN VR-1200A RECORDER (OVERHEAD MONITOR)

NOTE

If an electronic editor unit is included in the VR-1200A rack, the velocity compensator must be mounted externally. In this event, contact the Ampex field service engineer and obtain a custom external mounting kit and special instructions before proceeding with the installation.

NOTE

This installation is accomplished with material furnished in kit no. 1805184-05. Harness 1361798-01 (signal system harness) and cable 1361792-01 (velocity compensator-to-monitor cable) are furnished in the kit, but are not used when the velocity compensator is installed in a VR-1200A recorder.

1. AMTEC UNIT MODIFICATION IN VR-1200A RECORDER

Modify the Amtec unit as instructed below before installing the velocity compensator.

a. Disconnect all cables from the Amtec unit connectors and remove Amtec chassis from recorder.

b. Remove the shielded lead connecting relay K001-9 and board 6, pin U.

c. Remove connector J7 and associated lead to board 13 pin 5 from Amtec chassis.

d. Mount connector of kit-furnished harness 1360415-01 in J7 position on Amtec chassis.

e. Route the three leads of harness 1360415-01 along main harness, through grommet and hinge bracket, and along front of Amtec chassis. Lace new harness to original harness.

f. Make the following harness connections:

1. Solder conductor of cable from J7-C to board 6, pin U.

2. Solder shield of cable from J7-C to ground bus at board 6.

3. Solder conductor of cable from J7-B to board 13-E5.

4. Solder shield of cable from J7-B to ground bus at board 13.

5. Solder conductor of cable from J7-D to relay K001-9.

6. Solder shield of cable from J7-D to ground lug at relay K001.

7. Remove jumper from between pins M and T of board 6.

8. Solder separate jumpers from pins R, S, and T of board 6 to ground bus at board 6.

g. Remove board 6 from the Amtec chassis, and replace it with kit-furnished board 1360008.

h. Reinstall Amtec chassis in recorder, and reconnect all cables disconnected in step a.

2. RACK MOUNTING OF VELOCITY COMPENSATOR FOR VR-1200A RECORDER

If the recorder to be modified is not equipped with an electronic editor unit, install the velocity compensator in the lower left mounting position of the VR-1200A rack as instructed below.

a. Remove the door from the left hand bay of the VR-1200A cabinet.

b. Remove the bottom door hinge from the left hand bay.

c. Remove the 8-inch blank panel installed at the bottom mounting position of the left hand bay. Save the mounting hardware for re-use.

d. Assemble kit-furnished chassis support brackets, part no. 1361186, to the kit-furnished left- and right-rear chassis supports, part nos. 1361800 and 1361799.

e. Install the left- and right-rear chassis supports vertically along the sides of the bay inside the cabinet.

f. Insert the velocity compensator in the bottom left mounting position, using mounting hardware from step c. Install the kit-furnished blank panel, part no. 1360061, below the velocity compensator. Reinstall the door hinge removed in step b at this time, since the hinge shares mounting holes used by the velocity compensator and blank panel. Chassis rails on the velocity compensator should extend through the chassis support brackets on the chassis supports installed in step e.

g. Reinstall the door removed in step a.

3. VR-1200A INTERCONNECTIONS

Install kit-furnished interconnecting cables from the velocity compensator to other units of the recorder as instructed below.

NOTE

If the velocity compensator is mounted outside the VR-1200A rack, disregard the cable designations and dimensions in the following steps, and use equivalent cables furnished in the custom external mounting kit.

a. Connect cable 1361795-01 from velocity compensator connector J1 to Colortec connector J13.

b. Connect cable 1361795-02 from velocity compensator connector J2 to signal system connector J8.

c. Connect cable 1361795-03 from velocity compensator connector J3 to Amtec connector J4.

d. If the Colortec unit is a model 1012, connect cable 1361796-01 from velocity compensator connector J4 to Colortec connector J16. If the Colortec unit is a model 1011, connect cable 1361796-01 as follows:

1. Disconnect cable from Colortec connector J8.

2. Mount kit-furnished tee adapter to kit-furnished elbow adapter, and install elbow adapter on Colortec connector J8.

3. Reconnect cable disconnected in step 1. to one receptacle of tee adapter at Colortec connector J8.

4. Connect cable 1361796-01 from velocity compensator connector J4 to the tee at Colortec connector J8.

e. Connect cable 52596 from velocity compensator connector J5 to the ac power duct of the recorder.

f. If the VR-1200A is equipped with a Video Head Optimizer, connect cable 1361793-04 from velocity compensator connector J6 to control panel connector J7.

NOTE

This cable connection is applicable only for systems that are not equipped with the Mark III Electronic Editor.

g. If the VR-1200A is not equipped with a Video Head Optimizer, connect cable 1361793-03 from velocity compensator connector J6 to signal system connector J23.

h. Connect cable 1361797-01 from velocity compensator connector J7 to Amtec connector J7.

i. Locate the unused plug wired into the cable harness for audio monitor switch panel P9, mated with J9 at the monitor bridge unit. Connect this plug to velocity compensator receptacle J8.

INSTALLATION OF MODEL 1090 VELOCITY COMPENSATOR IN VR-1200B RECORDER (SIDE MONITOR)

NOTE

This installation is accomplished with material furnished in kit no. 1805184-06.

1. AMTEC UNIT MODIFICATION IN VR-1200B RECORDER

Modify the Amtec unit as instructed below before installing the velocity compensator.

a. Disconnect all cables from the Amtec unit connectors and remove Amtec chassis from recorder.

b. Remove the shielded lead connecting relay K001-9 and board 6, pin U.

c. Remove connector J7 and associated lead to board 13 pin 5 from Amtec chassis.

d. Mount connector of kit-furnished harness 1360415-01 in J7 position on Amtec chassis.

e. Route the three leads of harness 1360415-01 along main harness, through grommet and hinge bracket, and along front of Amtec chassis.

f. Make the following harness connections:

1. Solder conductor of cable J7-C to board 6, pin U.

2. Solder shield of cable J7-C to ground bus at board 6.

3. Solder conductor of cable from J7-B to board 13-E5.

4. Solder shield of cable from J7-B to ground bus at board 13.

5. Solder conductor of cable from J7-D to relay K001-9.

6. Solder shield of cable from J7-D to ground lug at relay K001.

7. Remove jumper from between pins M and T of board 6.

8. Solder separate jumpers from pins R, S, and T of board 6 to ground bus at board 6.

g. Remove board 6 from the Amtec chassis, and replace it with kit-furnished board 1360008.

h. Reinstall Amtec chassis in recorder, and reconnect all cables disconnected in step a.

2. RACK MOUNTING OF VELOCITY COMPENSATOR FOR VR-1200B RECORDER

Install the velocity compensator below the audio monitor in the left hand rack of the VR-1200B recorder as follows:

a. Remove door from left hand bay of VR-1200B cabinet.

b. Remove door mounting hardware (hinges, etc.) from cabinet below audio monitor.

c. Remove the 5-1/4-inch blank panel installed directly beneath the audio monitor, saving mounting hardware. The velocity compensator will be mounted in this position.

d. Locate the left- and right-rear chassis supports, which run vertically along each side of the bay inside the cabinet. Mount kit-furnished chassis support brackets, part no. 1361186, at the tapped holes located in each support at the level of the velocity compensator mounting position.

e. Insert the velocity compensator in the mounting position, and secure the chassis at the front of the cabinet. Reinstall the door mounting hardware removed in step b at this time, since the chassis and door mounting hardware share certain mounting holes. The chassis rails should extend through the chassis support brackets installed in step d.

f. Reinstall the door removed in step a.

3. VR-1200B INTERCONNECTIONS

Install kit-furnished interconnecting cables from the velocity compensator to other units of the recorder as instructed below.

a. Connect cable 1361795-04 from velocity compensator connector J1 to Colortec connector J13.

b. Connect cable 1361795-05 from velocity compensator connector J2 to signal system connector J8.

c. Connect cable 1361795-06 from velocity compensator connector J3 to Amtec connector J4.

d. If the Colortec unit is a model 1012, connect cable 1361796-01 from velocity compensator connector J4 to Colortec connector J16; if the Colortec unit is a model 1011, connect cable 1361796-01 as follows:

1. Disconnect cable from Colortec connector J8.

2. Mount kit-furnished tee adapter to kit-furnished elbow adapter, and install elbow adapter on Colortec connector J8.

3. Reconnect cable disconnected in step 1 to one receptacle of tee adapter at Colortec connector J8.

4. Connect cable 1361796-01 from velocity compensator connector J4 to the tee on Colortec connector J8.

e. Connect cable 52596 from velocity compensator connector J5 to the ac power duct of the recorder.

f. Remove the dummy plug from control panel connector J7 of the recorder. Connect cable 1361793-02 from velocity compensator connector J6 to control panel connector J7. Check that there is a cable 1361793-01 installed from control panel connector J6 to signal system connector J23.

g. Connect cable 1361797-01 from velocity compensator connector J7 to Amtec connector J7.

h. Locate the unused plug wired into the cable harness for audio monitor switch panel P9, mated with J9 at the monitor bridge unit. Connect this plug to velocity compensator receptacle J8.

POST-INSTALLATION PROCEDURE

1. POST-INSTALLATION ADJUSTMENTS TO VELOCITY COMPENSATOR

The adjustment procedures of this paragraph must be performed to match the velocity compensator to the Colortec and Amtec accessories. Perform the adjustments as follows:

a. Play back a color test signal, taking care to achieve the best possible signal-to-noise ratio.

b. Set the VELOCITY COMPENSATION switch to ON.

c. Trigger an oscilloscope from the negative-going edge of the pulse present at TP1, board 6. Adjust the oscilloscope for a sweep rate of 20 Usec/division and for a vertical sensitivity of 0.5V/division.

d. Observe the amplified subtracter-pulse waveform present at TP2, board 9, with attention directed to the first pulse following the switching transient which occurs at sweep triggering time (see Figure 3). This pulse is associated with the second picture line in head band number 1.

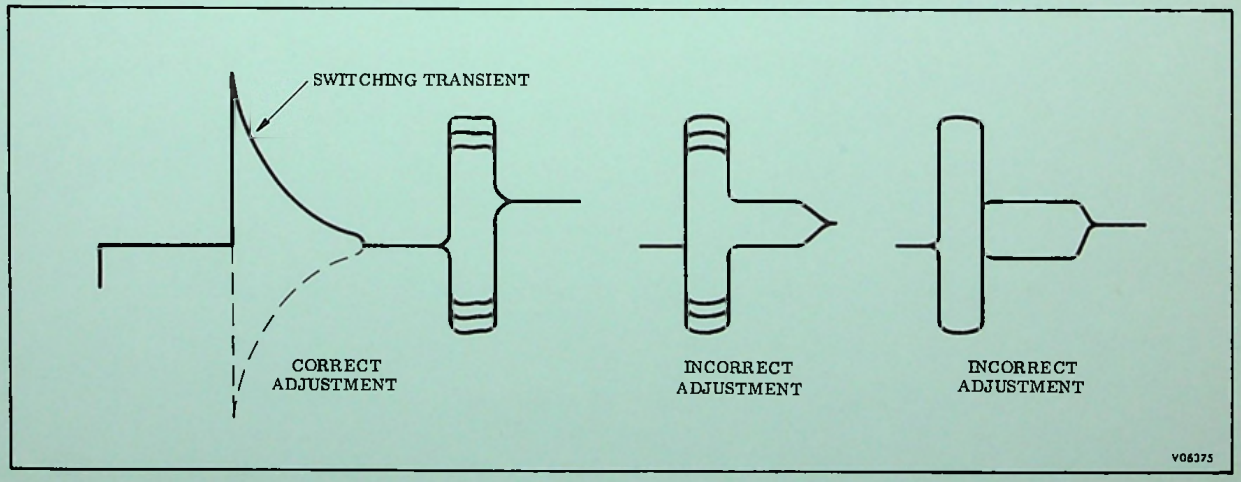


Figure INST-3. Waveform for Colortec Gain Adjustment

e. Set the transport suppression switch on the recorder signal system to OFF, and make a slight adjustment of the tip engagement, so that the early portion of the pulse is randomly modulated in height.

NOTE

This first portion of the pulse is the differentiated Amtec error signal, and the large random modulation of the signal is caused by interference with the leading edge of sync by the unsuppressed head switching transient. The latter portion of the pulse is the same, except that the Colortec error component has been added to cancel the modulation caused by false sync timing. Therefore, when the proportion of the Colortec and Amtec error is correct, the large excursions should be removed from the latter portion of the pulse; and only those caused by random noise should remain.

f. Rotate R59 of board 9 through its complete range, and then set it at the point where excursions of the latter portion of the pulse are smallest.

The following steps describe an alternate method of making the adjustment to board 9:

a. Play back a pre-recorded tape of color bar test signals (preferably a reference tape). The tape must be of high quality, with a high signal-to-noise ratio.

b. Adjust the guide height and tip projection on the head assembly to minimize time-base errors.

c. Make any signal system adjustments required to ensure a playback signal with high signal-to-noise ratio.

d. Turn the Amtec mode selector to CTL OFF. Set the Colortec mode selector to STD COLOR.

e. With the guide height or tip projection controls, introduce a small amount of time-base error.

NOTE

This error must not exceed the correction capabilities of the Colortec accessory (±280 nsec). The error will be at head-rotation rate (240 or 250 Hz).

f. Adjust variable resistor R59 on velocity compensator board 9 to obtain the optimum correction (i.e. color picture with minimum color hue shift or other evidence of velocity error) in the display on a color monitor.

g. Return the Amtec mode selector to its original position.

2. AMTEC LEVEL AND CORRECTION GAIN ADJUSTMENTS

Adjustment of the dc output level and correction gain on Amtec board 6 (supplied with the velocity compensator kit) is made to match board 6 to the Amtec unit in which it has been installed. For the purpose of the following procedure, it is assumed that the Amtec is functioning properly, and all other internal adjustments are correctly set.

a. Mount Amtec board 6 on the appropriate extender board.

b. Turn the recorder system power on; set the Amtec mode selector to FAST. Be sure the recorder is supplied with a video input signal.

c. Check for a dc voltage level of zero at test point TP1 on Amtec board 7; if necessary, adjust variable inductor L3 on board 7.

d. Adjust resistor R43 on board 6 for precise centering of the Amtec CONTROL VOLTAGE meter.

e. Record and play back a color test signal, during playback, use the Amtec, Colortec, and Velocity Compensator accessories in the modes appropriate for color reproduction.

f. Adjust the Amtec EXT REF POSITION control for a zero-center reading on the CONTROL VOLTAGE meter.

g. Adjust the guide height and tip engagement controls of the head assembly to eliminate geometric errors (scalloping and/or skewing).

h. Set the recorder WAVEFORM MONITOR selector to AMTEC ERROR and the waveform monitor INPUT selector to B.

i. Using the Intersync servo HORIZONTAL STABILITY controls, introduce a low-frequency time-base error at field rate (60 or 50 Hz) or head-rotation rate (240 or 250 Hz); the error should be about 0.5 Usec p-p (1/2 of full scale on the waveform monitor). Be sure the introduced error does not exceed the Amtec correction range.

j. Set variable capacitor C7 to the center of its range.

k. Set the recorder WAVEFORM MONITOR selector to COLORTEC ERROR. A residual low-frequency signal of the same shape as that seen in the Amtec error signal should be seen; this is indicative of improper correction gain.

l. From among the capacitors included in the velocity compensator kit, choose a value for capacitor C3 which eliminates or almost eliminates the error component. The capacitor will have to be selected by a trial-and-error method, plugging the leads into the receptacle on board 6.

m. Adjust C7 to completely eliminate the error component.

n. Solder the selected capacitor in place, then re-adjust C7.

o. Repeat steps c and d.

p. Return board 6 to its normal position.

CHAPTER 3

OPERATION

INTRODUCTION

The velocity compensator has one control, the VELOCITY COMPENSATION switch, which is located on the front panel (Figure 1.1-1). The unit has no indicators. To place the velocity compensator in operation, set the VELOCITY COMPENSATION switch to ON.

CHAPTER 4

THEORY OF OPERATION

INTRODUCTION

Chapter 4 comprises two sections. Section I is titled "System Theory," and is concerned with the functional interrelationship between the velocity compensator and the rest of the VR-1200 system (especially the Amtec and Colortec accessories).

Section II, titled "Velocity Compensator Theory," is concerned with the velocity compensator itself. This section provides an overall functional analysis, as well as a functional analysis of each separate circuit board.

SECTION I

SYSTEM THEORY

4.1-1 GENERAL

4.1-2 Physical disparities between rotary-head record and playback operation can cause time-base errors through variance between record and playback head-to-tape velocities. The velocity compensator, in conjunction with the Colortec and Amtec accessories, compensates for these variances.

4.1-3 The compensation process adds a corrective velocity-error component to the Amtec accessory waveform. However the video signal is not affected, since it does not pass through the compensator.

4.1-4 FUNCTION

NOTE

Before the velocity compensator can be clearly understood, a knowledge of the Amtec and Colortec accessories is required. Information concerning these accessories can be found in Ampex manuals P59560 (Colortec), 1809984 (Universal Colortec), and 1809923 (Amtec).

4.1-5 One complete rotation of the head drum covers 64 horizontal video lines, with each of the four heads covering 16 lines during its excursion across the tape. The velocity compensator operation is based on the assumption that the velocity error in each line is generally repetitive during successive head rotations.

4.1-6 The Amtec and Colortec accessories supply the compensator with time-base error indications (as voltage levels) for each line of video. The compensator algebraically adds these error indications, then stores each sum in a specific memory capacitor as a voltage level (Figure 4.1-1).

4.1-7 Capacitor loading proceeds repetitively for 500 msec, building up in each capacitor a voltage level analogous to the time-base error changes occurring throughout write time. For readout, the stored voltage levels are sequentially timed into a temporary storage capacitor, which then drives a ramp generator. The generator provides a ramp proportionate to the voltage level previously stored in the capacitors.

4.1-8 The proportionate ramp is added to the Amtec accessory error signal and returned to the Amtec delay line, which then provides a corrected velocity error signal to the Colortec accessory. The final Colortec output is then a time-corrected, composite video signal which is applied to the processing amplifier.

4.1-9 Because the proportionate ramp must begin as the Amtec accessory starts to process a line of video, a horizontal (h) trigger signal is brought into the velocity compensator. Eight other signals are also supplied to the velocity compensator from external sources. The processing amplifier supplies one, a vertical drive signal which is extended and then used to inhibit the write function of the compensator during the vertical interval.

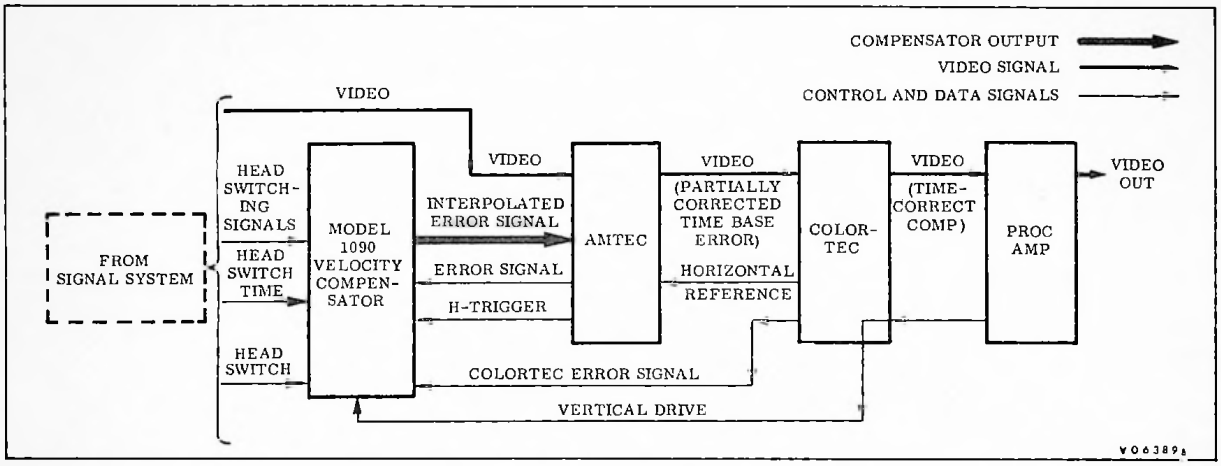
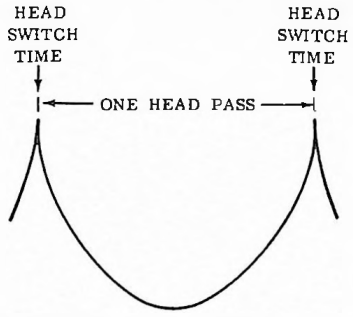


Figure 4.1-1. Overall System Functional Block Diagram

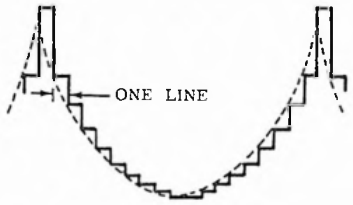
4.1-10 The other signals are parts of the head decoder timing: four 240 pulse-per-second (60 field operation) or 250 pulse-per-second (50 field operation) signals from the signal system (tach, tach +90°, inverted tach, and inverted tach +90°). The signal system also provides head-switching time and head-switching information for the line-decoding function of the velocity compensator. The derivation of all these signals is detailed in VR-1200 manual 1809952, and VR-1200B manual 1809967.

4.1-11 Figure 4.1-2 shows a representation of the actual time-base error caused by guide-height misadjustment (detail A) during one head pass, the line-by-line correction waveform of the Amtec and Colortec accessories (detail B), and algebraic resultant of these waveforms (detail C). Ideally, these signals should cancel; however, since the Amtec and Colortec accessories correct on a line-by-line basis, and not continuously, an error component is still left. This residual error component is velocity error.

4.1-12 The velocity compensator generates a simulated velocity error waveform (detail D), and adds it to the actual Amtec error waveform. When algebraically added, these signals result in an error signal which very closely approximates the actual error waveform (detail E). This signal is used to drive the delay lines in the Amtec accessory, and allows the Amtec to pass on a video signal virtually free of geometric and velocity error.



Detail A. Actual Time-base Error Waveform (Error caused by misadjustment of vaccum guide height)



Detail B. Combined Amtec and Colortec Error Waveforms showing line-by-line correction

Detail C. Velocity error component remaining (A – B)

Detail D. Simulated velocity error signal generated by velocity compensator

Detail E. Output of velocity compensator (D + B)

V07140

Figure 4.1-2. Derivation of Amtec Delay Line Driving Signal

SECTION II

VELOCITY COMPENSATION THEORY

4.2–1 GENERAL

Section II is concerned with the functions of the velocity compensator itself. The overall functional analysis describes the four main processes of the unit (write, address, read and timing) while the detailed analysis is concerned with each separate board.

NOTE

Throughout this section the frequencies of the timing signals are for 60-field operation. For 50-field operation, substitute the frequencies given in paragraph 4.1-10.

4.2–2 OVERALL FUNCTIONAL ANALYSIS

4.2–3 Write Processing

4.2-4 The compensation sequence begins with error signals from the Amtec and Colortec accessories being applied to the write circuitry of board 9. Here the signals are compared, algebraically added, and the resulting signal (sum) applied to the input of an amplifier. The amplifier output is applied to a memory-loading gate to await a T4 (write) pulse from the timing generator (board 7). See Figure 4.2-1.

4.2-5 The write (or "capacitor loading") process is done continuously, except during read time, and extended vertical drive. The extended vertical drive signal is generated in the compensator (board 1) using vertical drive from the processing amplifier. The purpose is to ensure that no writing takes place during vertical drive, since data derived during that period would be erroneous.

4.2–6 Addressing

4.2-7 Two addressing functions take place: one to determine which head is playing and the other to determine what specific capacitor of the memory is to store error data. Determination of which head is playing at a particular time (decoding) is accomplished by the head-decoder circuits of board 6. This board takes data from the signal system and energizes the gating for one of four lines going to the memory. This determines which of the four major subdivisions of the memory capacitor-band (two boards per head) will store error information generated during a particular head pass.

4.2-8 The determination of the specific memory capacitor which is to hold error data is made by the gates and flip-flops of the line-counter circuitry (boards 3, 4, and 5). The line counter receives a pulse from the Amtec accessory for the beginning of each new video line as part of the address information. If a head pass is starting, it also receives a reset counter pulse to identify the first count of the sequence.

4.2-9 As the counter receives information from the write section, it sequentially enables and disables successive gates until the selected memory capacitors have all been charged. At this point the counter resets for a new sequence. The sequence is arbitrary, and not related to the timing of the video line. The head decoding process and the line counting sequence are the same for both the read and write functions.

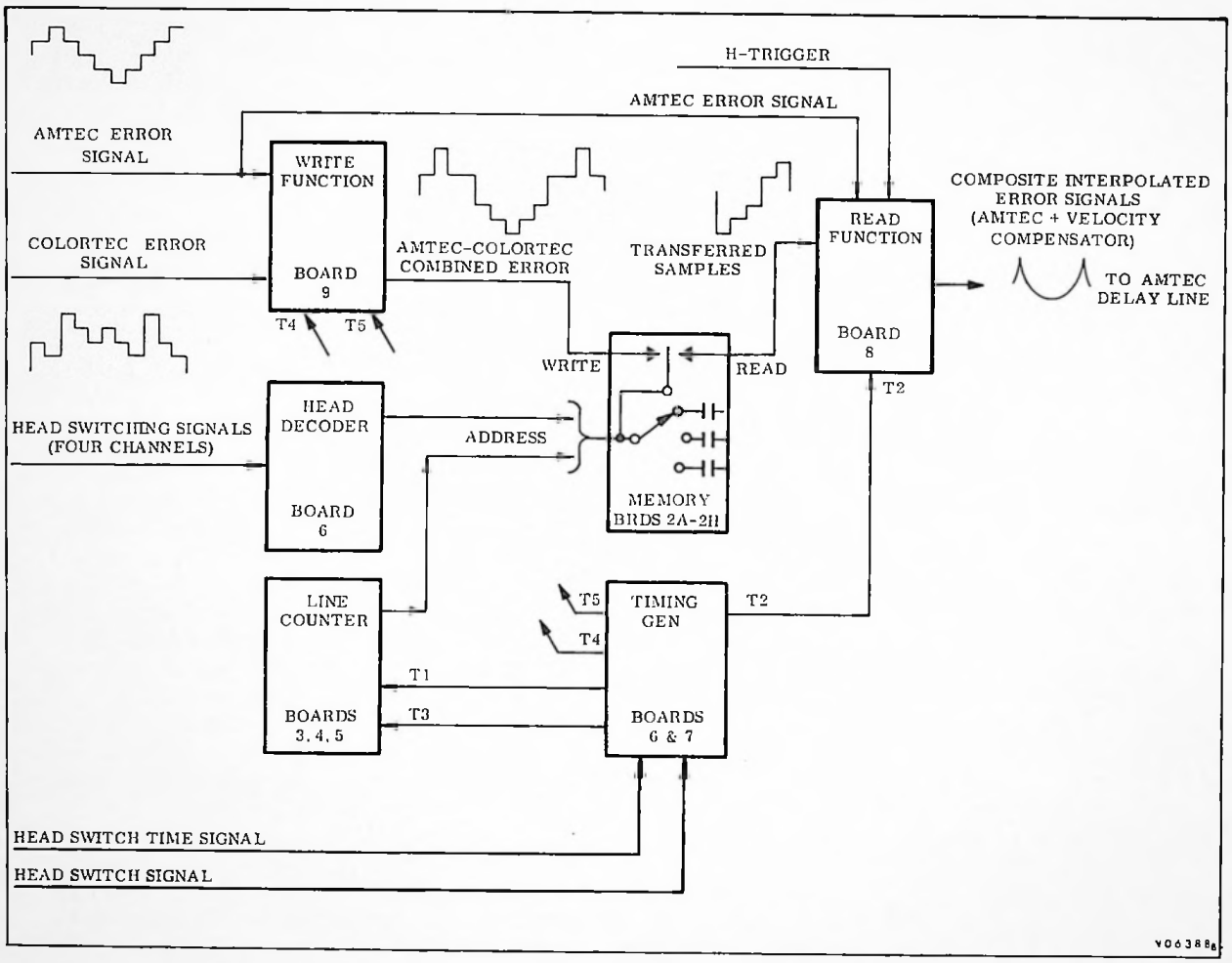


Figure 4.2-1. Velocity Compensator Functional Block Diagram

NOTE

The commutator-type switching shown symbolically in the MEMORY block of Figure 4.2-1 is for purposes of illustration only. Actual switching is done electronically by the head-decoder and the line-counter.

4.2-10 In essence, the line-counter simply opens the gate to each memory capacitor sequentially, and for a uniform period of time. During this time, information can be deposited in the capacitor, or retrieved from it, depending on whether the compensator is in the read cycle or the write cycle.

4.2-11 Read Processing

When reading time arrives, the head-decoder and the line-counter again select specific memory capacitors and connect them to specific input-output lines. But now, rather than voltage being stored, it is sampled and transferred to a temporary storage capacitor shortly before the memory

is to be read out. When the next read-function pulse (T2) occurs, voltage in the temporary storage capacitor is fed to the ramp generator, amplified, then added to the Amtec error signal. The composite, interpolated error signal is then used to control the variable delay line of the Amtec accessory.

4.2-12 Timing

4.2-13 The complete timing ring of the velocity compensator consists of timing generator drive circuits, and of the circuits of the timing generator itself.

4.2-14 The timing generator drive circuits accept external signals, then process the signals which, in turn, drive the timing generator. The timing generator then provides timing pulses T1 through T5.

4.2-15 DETAILED FUNCTIONAL ANALYSIS

4.2-16 Write Processing (Board 9)

4.2-17 GENERAL. The circuits of board 9 perform two functions: processing error signals from the Colortec and Amtec accessories into the memory, and processing the two error signals in a separate adder for quick-look purposes at TP014 (Figure 4.2-2). Chapter 6 of this manual contains the schematic diagram for board 9.

4.2-18 ANALYSIS. At the start of a line of video, the Amtec accessory measures the time-base error (tbe) of the leading edge of sync. The measured error is then applied to the main error-signal adder of the velocity compensator.

4.2-19 A few microseconds later the time-base error from the Colortec accessory (in angular measure from initial color burst) is also applied (through amplifier X1) to the adder. The output of the adder is a combined tbe indication. This indication is generated for each line of video until a T5 signal is applied to the subtracter clamp.

4.2-20 With the coincidence of a T4 signal (through isolation amplifier X5) at one side of the memory loading gate, and T5 at the other side, the gate is enabled, and the combined error signal is applied to the memory circuits of board 2.

4.2-21 When the T5 signal is received at the clamp, a ground is supplied to the temporary storage capacitor, erasing the stored data.

4.2-22 The quick-look tbe adder functions in a manner similar to the main adder, except that the Amtec error signal is supplied from the interpolated-signal output of the write circuits (board 8). The output of the tbe adder is supplied to TP014 rather than to the memory circuits of board 2.

4.2-23 Addressing

4.2-24 GENERAL. The initial function to be performed by the addressing circuits is determination of which head is playing at any particular time. This determination, which will cause selection of specific boards and capacitors of the memory section, is performed by the head decoder, board 6. A schematic diagram of the head decoder may be found in Chapter 6 of this manual.

4.2-25 The second addressing function is performed by the line-counter circuits of boards 3, 4, and 5. These circuits perform an electronic-commutator function, counting through 16 lines and sequentially gating the memory section input to store or read out error data. A logic diagram of the line counter can be found in Chapter 6.

4.2-26 The actual address in memory is determined by the coincidence of pulses from the line-counter at one side of a memory gate (board 2) and a pulse from the head decoder at the other.

4.2-27 HEAD DECODER (PART OF BOARD 6). As indicated in Figure 4.2-3, signals are applied from the signal system to switch the heads in 1-4-2-3 sequence. Each of the four signals is applied to an

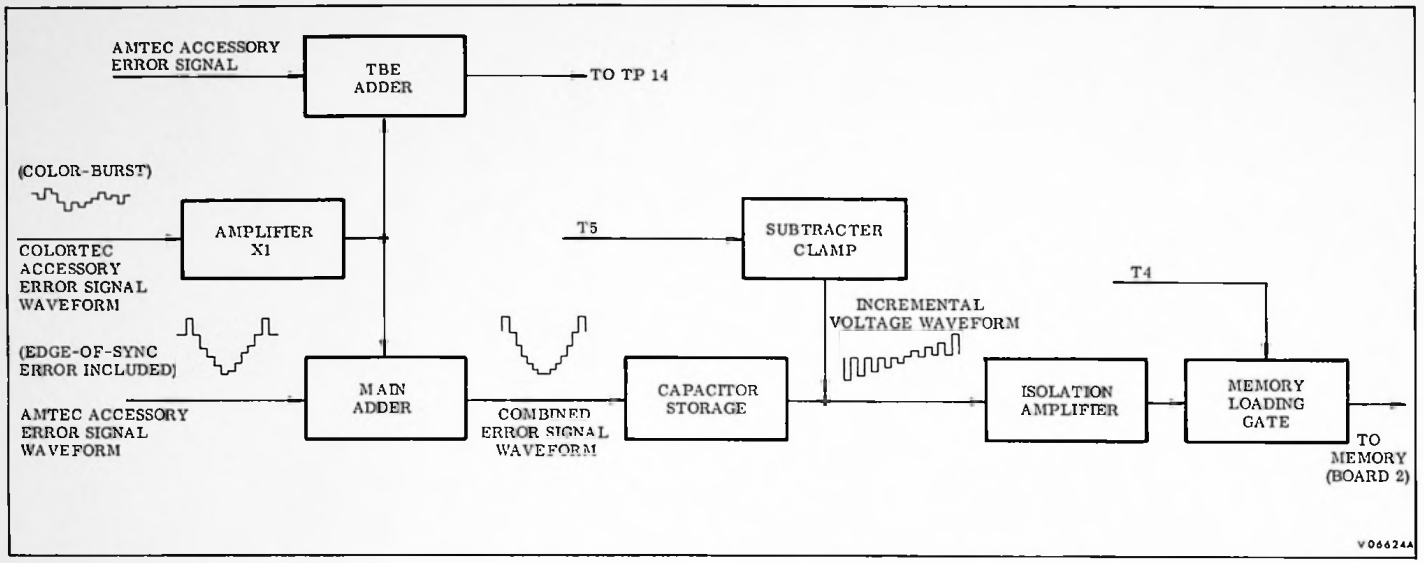


Figure 4.2-2. Write Function Block Diagram

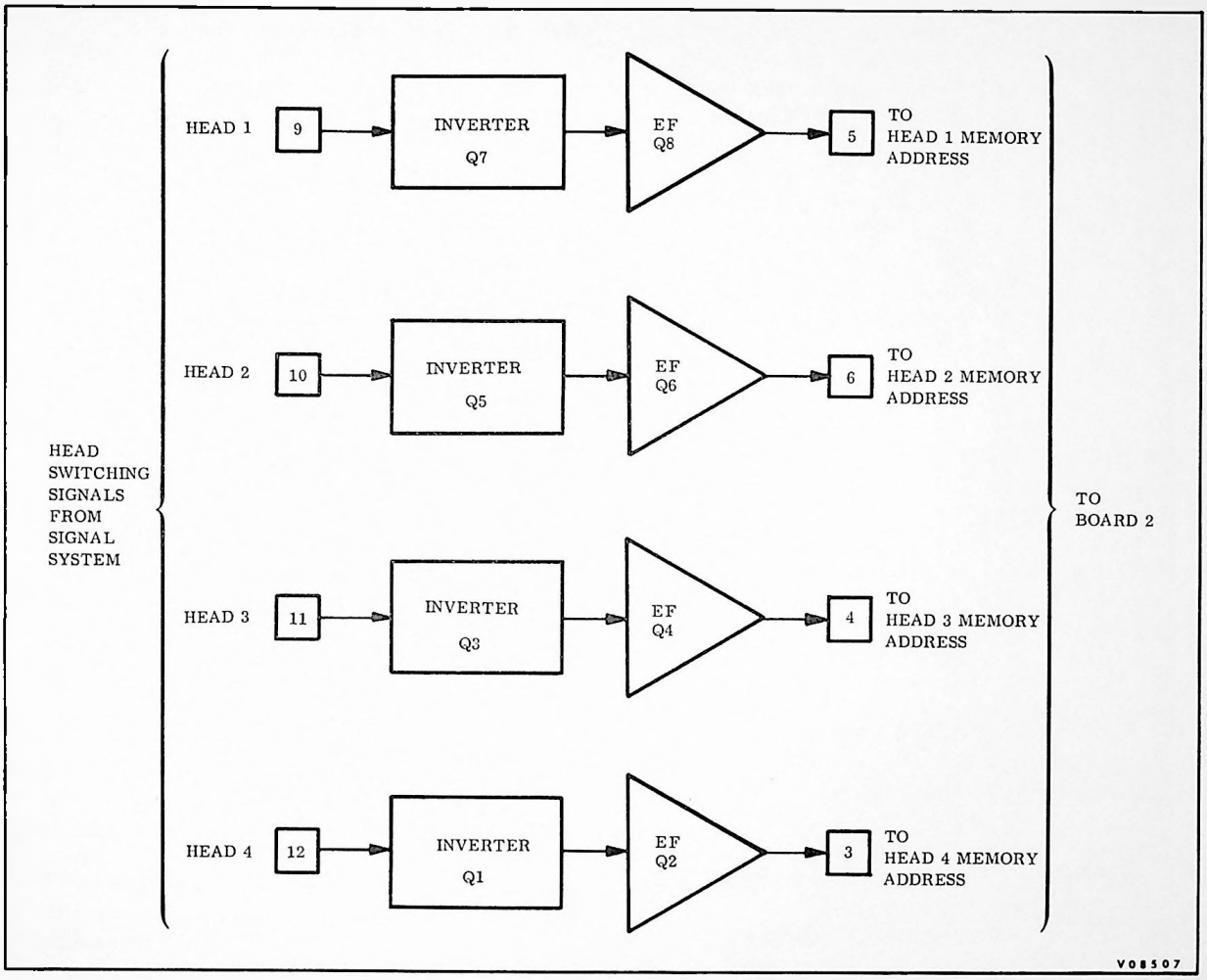


Figure 4.2-3. Head Decoder Simplified Block Diagram

inverter and emitter follower. The output is applied to the timing generator on board 7, as explained in paragraph 4.2-46.

4.2-28 LINE COUNTER ANALYSIS (BOARDS 3, 4, 5). The line counter function is performed by a binary-coded decimal (bcd) five-element flip-flop array (1-2-4-8-16) and associated gating (Figure 4.2-4). Two inputs from board 6 (reset and advance) provide basic line counter data.

NOTE

In this chapter, the line-counter will be described in terms of AND/OR logic. However, if reference is made to the detailed logic diagram, in Chapter 6, the accompanying drawing of the actual integrated-circuit modules should be studied.

4.2-29 The line-counter sequence begins with a reset pulse, which is generated as each head ends its pass across the tape. At this time all flip-flops of board 5 are driven to the reset condition.

4.2-30 With the beginning of a new head pass, the line-count advance pulse is received by the initial flip-flop and the counting sequence begins. The line count developed by the set/reset combination of the five-element bcd flip-flop counter generates sixteen counts.

4.2-31 Because each of the 16 counts generated by the flip-flop array must be assigned to one of 64 separate address locations of the memory, each line is driven through AND/OR gating which provides the required spread as well as bcd decoding.

4.2-32 The output of the gates is then driven through an array of inverting OR gates and applied to read/write-select AND gates. These gates, alternately enabled by timing pulses T1 or T3, determine which combination of memory capacitors is to be addressed at read or write time.

4.2-33 Figure 4.2-5 is a simplified illustration of the line-counting process during the write cycle. In this illustration, flip-flops 1 and 3 of the counter (representing binary one and four) are in the set state, with a binary 1 present on the set outputs. The two outputs energize an AND gate, providing an output which represents decimal 5. Decimal numbers 10 and 12 are not represented at this time because no coincidence exists.

4.2-34 The binary 1 representing decimal 5 is buffered through an OR gate section to achieve spread, then through an inverting gate to satisfy logical requirements. The output of the inverting gate is applied to a final AND gate, which, with the coincidence of T3, writes the representative decimal 5 signal (through an OR gate) into the correct line 5 location in the memory.

4.2-35 Read Processing (Board 8)

4.2-36 GENERAL. The read board (block diagram Figure 4.2-6) accepts time-base error data from the memory, generates a proportional ramp, and adds it to a time-base error signal from the Amtec accessory. It then supplies the resulting interpolated error voltage to the Amtec accessory delay line. The interpolated error signal is also supplied to the tbe adder circuit of board 9. A schematic diagram of board 8 can be found in Chapter 6 of this manual.

4.2-37 ANALYSIS. When time T1 initiates the read function, the error voltage stored in the memory is applied through the first X1 amplifier to one input of the slope storage gate. With the coincidence of T2 at the other input, the gate is enabled and the error voltage is applied through the second X1 amplifier to the ramp generator.

NOTE

All X1 amplifiers of Figure 4.2-7 are unity-voltage-gain isolation amplifiers which provide high current-amplification.

4.2-38 The ramp generator provides a ramp proportionate to the voltage level at the input, then supplies the ramp (through the third X1 amplifier) to the input of the error signal adder circuitry. A second output of the amplifier is supplied to the A-scope.

4.2-39 Because the proportionate ramp must begin as the Amtec accessory starts to process a video line, a horizontal (h) trigger signal is brought into the velocity compensator where it enables the ramp reset clamp and allows generation of the next ramp.

4.2-40 In the error signal and ramp adder, the error signal input from the Amtec accessory and the proportionate ramp signal are added and the resulting interpolated

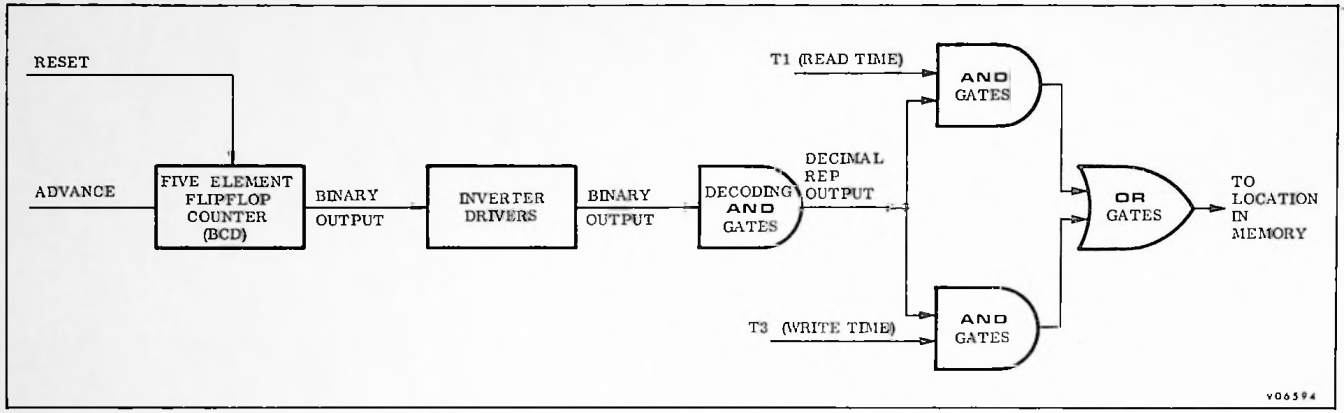


Figure 4.2-4. Line Counter Block Diagram

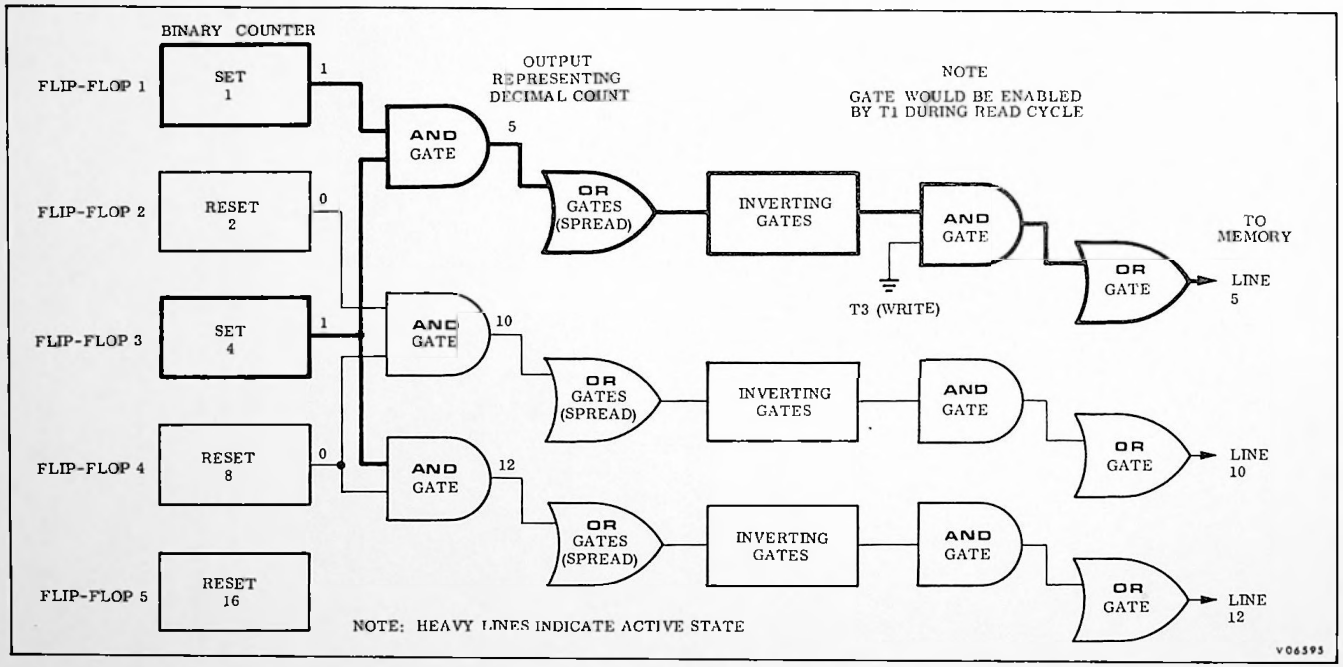


Figure 4.2-5. Typical BCD Line Count

AMPEX

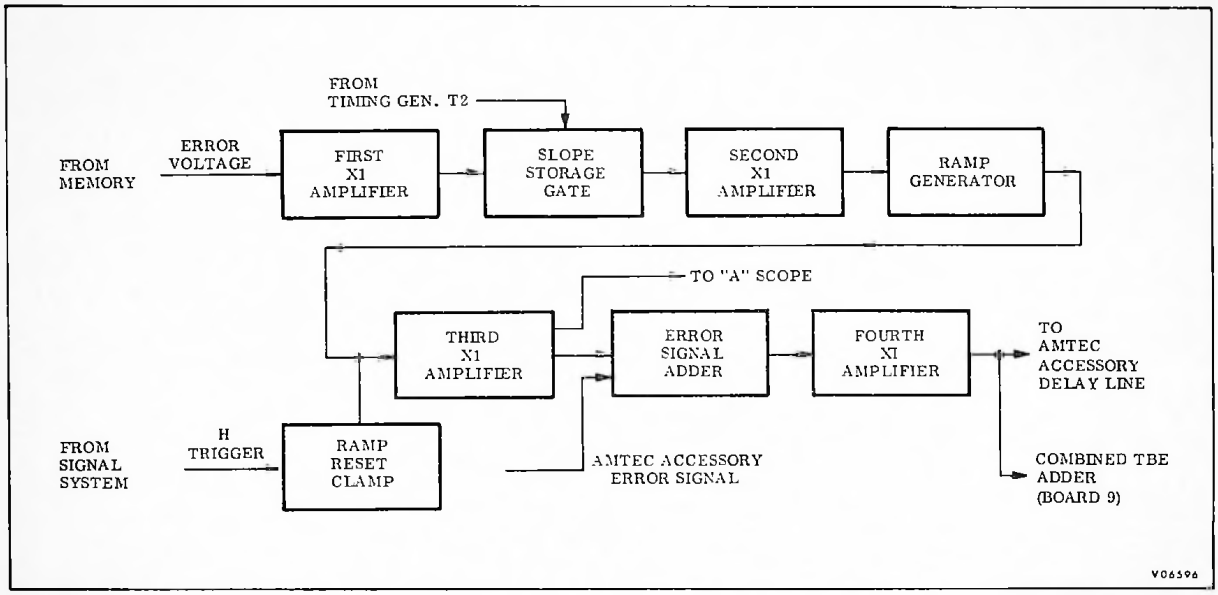


Figure 4.2-6. Read Function Block Diagram

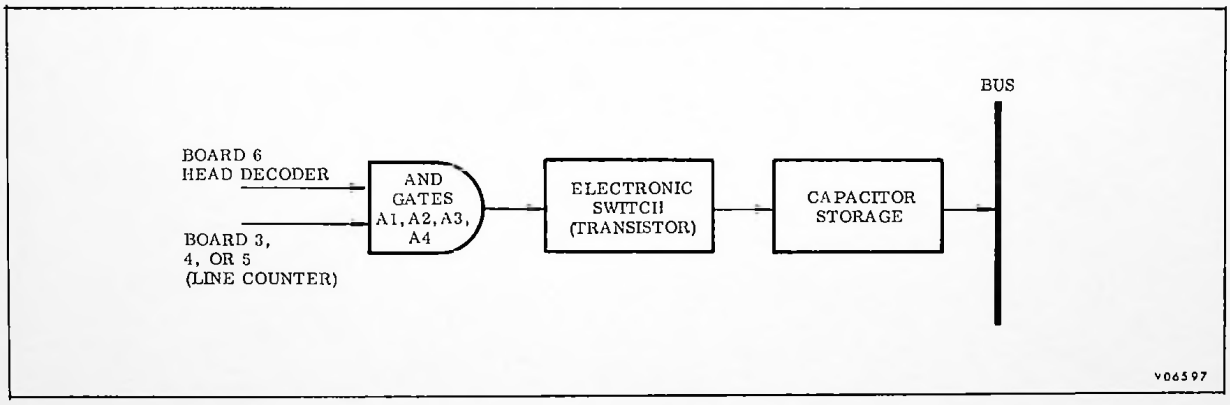


Figure 4.2-7. Memory Block Diagram

error voltage applied (through the fourth X1 amplifier) to the Amtec accessory delay line. A parallel output is supplied to the combined time-base error circuitry of board 9.

4.2-41 Memory (Board 2)

4.2-42 GENERAL. The memory is made up of eight boards (2A through 2H) which provide the gating and storage facilities for error-data storage and retrieval. A schematic diagram of board 2 can be found in Chapter 6 of this manual.

4.2-43 ANALYSIS. Both read and write sequences begin with selection (address) of specific capacitors by the combination of head decoder and line-counter coincidences at the inputs to AND gates A1, A2, A3, and A4 (Figure 4.2-7).

4.2-44 Memory storage is available for as many lines as exist in one complete rotation of the record head. During the write function, a memory capacitor is electronically connected to its associated video line each time the line is scanned by the head. By the end of any one write time, the capacitor has been charged to a value representing the average velocity error for that time.

4.4-45 The memory is read (the voltage sampled) and transferred to read circuitry for temporary storage shortly before a new head-pass is to begin.

4.2-46 Timing Circuits (Boards 6 and 7)

4.2-47 GENERAL. Timing generator drive circuitry, which initiates the timing sequence, shares board 6 with head-decoder circuitry. The circuitry of the timing generator is mounted on board 7. The timing circuits of boards 6 and 7 comprise the complete timing ring of the velocity compensator. Schematic diagrams of board 6 and board 7 can be found in Chapter 6 of this manual.

4.2-48 ANALYSIS. In the timing generator drive circuitry (board 6) a head switch time signal starts a cycle of a self-ringing circuit. The output of this circuit is supplied to the timing generator (board 7). At the end of T5, the timing generator produces a timing-ring halt signal which is fed back into the self-ringing circuit to halt operation.

4.2-49 The timing generator provides timing pulses T1 through T5 (Figure 4.2-8). Pulse T1 determines time of selection of memory capacitor for the read function. T2, which takes place during T1, determines duration of actual reading. Pulse T3 determines time of selection of memory capacitor for the write function; while T4, which takes place during T3, determines duration of actual writing. In both reading and writing, the time of selection exceeds the duration of the actual function. This provides a safety factor which prevents writing into, or reading from, a non-selected capacitor.

4.2-50 Pulse T5 is high during the entire time of extended vertical drive. T5 is also high during the first line after head switching. T4 is inhibited when T5 is high to inhibit writing into capacitors during the first video line after switching, and during vertical drive.

4.2-51 Power Supply

4.2-52 GENERAL. The power supply employs a full-wave, 4-diode bridge to supply positive 12 volts and negative 12 volts to the appropriate circuits of the velocity compensator. Components of extended vertical drive share board 1 with power supply amplifier components. Transformer, rectifier, filter, and regulator components are mounted on the front of the chassis, external to board 1. A schematic diagram of board 2 can be found in Chapter 6 of this manual.

4.2-53 ANALYSIS (BOARD 1). The output from the secondary winding of the transformer is rectified by a diode bridge the unregulated output of which is approximately 36 volts dc. This output is routed through a series current regulator and two shunt voltage regulators (in series). Each of the shunt regulators develops 12 volts dc.

4.2-54 Each regulator employs a power transistor acting as a shunt element. This transistor is controlled by a two-stage, temperature-compensated dc amplifier which uses a low-temperature-coefficient reference diode as a comparison source. A trimming resistor on each regulator provides control of the positive and negative outputs. Each regulator includes a capacitor across the output to supply peak load currents.

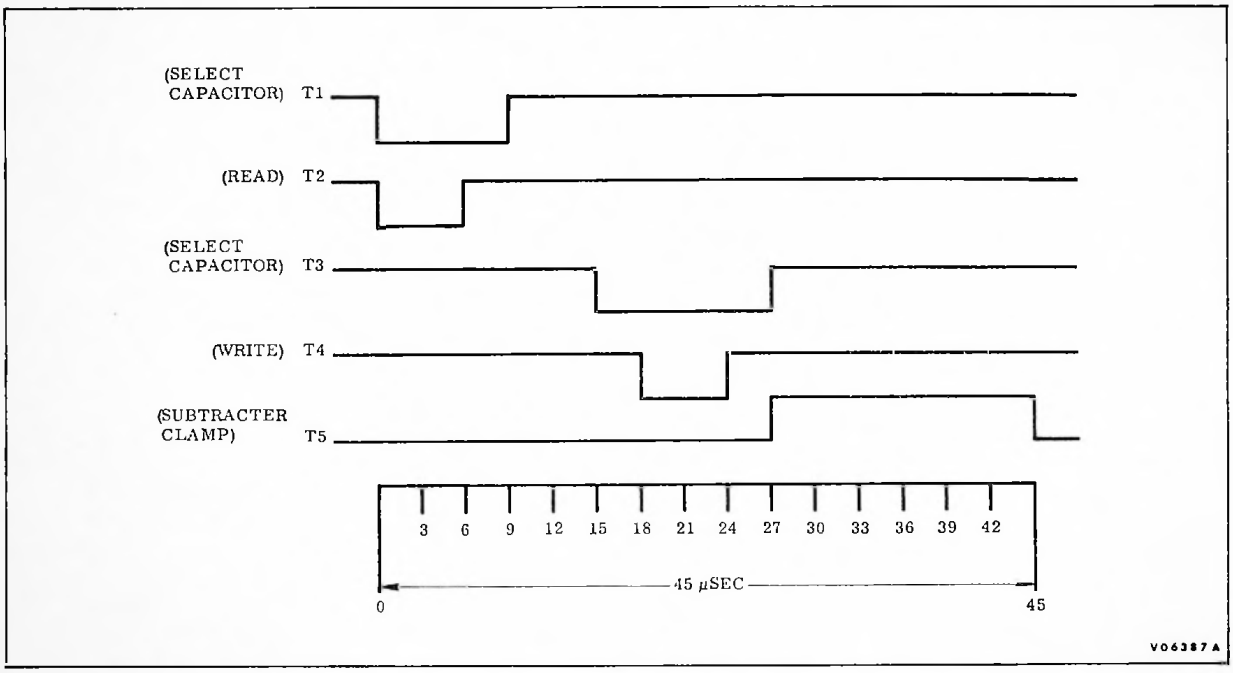


Figure 4.2-8. Pulse Timing Diagram

CHAPTER 5

MAINTENANCE

INTRODUCTION

Chapter 5 comprises two sections, Preventive Maintenance and Corrective Maintenance. Preventive maintenance is concerned with brief advice about cleaning and inspection. Corrective maintenance provides trouble analysis information, performance checks, and adjustment procedures.

SECTION II

CORRECTIVE MAINTENANCE

5.2-1 GENERAL

5.2-2 The procedures provided in this section are intended to assist in the return of a malfunctioning unit to operational status. Included are a logical approach to trouble analysis, performance checks with tolerances indicated, and adjustment procedures to bring out-of-tolerance circuits within limits.

5.2-3 All corrective maintenance routines are based on the assumption that the associated videotape recorder (vtr) and its Amtec and Colortec accessories are operating properly.

5.2-4 TROUBLE ANALYSIS

5.2-5 The first indication of velocity compensator malfunction is a manifestation of velocity error (e.g., color banding) on the monitor screen.

NOTE

Certain mechanical misadjustments (e.g., guide-height errors or guide eccentricity errors of more than 400 microinches) can cause time-base errors outside the corrective capabilities of the velocity compensator.

5.2-6 At this point, before proceeding with more detailed trouble analysis, perform a careful visual inspection of the unit. Check all components and wiring for security and correct connections. Also check for evidence of physical damage to plugs, connectors, or other parts. If no visible cause for the malfunction can be found, proceed with the performance checks of paragraphs 5.2-9 through 5.2-18. If observed indications are not within described limits, perform the adjustment procedures of paragraphs 5.2-19 through 5.2-29.

5.2-7 If the board concerned cannot be adjusted satisfactorily, it should be removed from the chassis and repaired or replaced. Repair of defective boards (as well as defective wiring) can be guided by reference to the appropriate schematic, wiring diagram, or chassis layout of Chapter 6.

5.2-8 SPECIAL TOOLS AND TEST EQUIPMENT

Table 5.2-1 lists test equipment suitable for performance of checks and adjustments.

Table 5.2-1. Test Equipment

QTY	EQUIPMENT	MODEL
1	Oscilloscope	Tektronix 543, or equivalent
1	Preamplifier	Tektronix Z, or equivalent
1	10:1 Probe	Tektronix P6006, or equivalent
2	1:1 Probe	Tektronix P6028, or equivalent
1	DC VTVM	Hewlett-Packard 412A, or equivalent

5.2-9 VELOCITY COMPENSATOR PERFORMANCE CHECKS

These checks are designed to demonstrate the operational capability of the velocity compensator. If any indication falls outside the tolerance listed, refer to paragraph 5.2-19. Begin the check by playing back a prerecorded tape containing color information (color bars), and proceed as follows:

a. Set the color monitor VIDEO MONITOR switch to OUTPUT, and the VELOCITY COMPENSATION switch to the OFF position.

b. Introduce a time-base error by rotating the female guide height adjustment until the monitor shows a considerable amount of color-banding.

c. Set the VELOCITY COMPENSATION switch to the ON position. Color-banding should disappear. If color-banding does not disappear, proceed with subsequent steps.

d. For the measurements discussed in subsequent steps, use an oscilloscope and a 1:1 probe. Check system test points for the presence of vertical drive (TP004), horizontal trigger (TP005), Amtec error (TP001), and Colortec error (TP002).

e. Connect the probe successively to each of the system test points indicated in Figure 5.2-1. If no signals are observed at any test point, or if signals are observed but are out of tolerance, refer to the maintenance manual for the VR-1200.

f. Connect the probe successively to each system test point indicated in Figure 5.2-2. If signals are out of tolerance, board 6 is defective and must be repaired or replaced.

5.2-10 PERFORMANCE CHECKS FOR INDIVIDUAL BOARDS

The checks of the following paragraphs are designed to test the performance of specific boards. If a board falls outside the tolerances listed, follow the instructions provided.

5.2-11 Power Supply Performance Checks

These checks are designed to demonstrate the operational capability of the power supply (board 1). If any indication falls outside the tolerance listed, repair or replace the board. To perform the checks, proceed as follows:

a. Using the dc vtvm set to the 100 volts scale, check the voltage between test points TP1 (+) and TP3 (red and white, respectively, on board 1). The meter should indicate +36 (±1.5)V.

b. Check the voltage between TP1 (red, board 1) and ground. It should be +12 (±0.1)V.

c. Check the voltage between TP2 (blue, board 1) and ground. It should be -12 (±0.1)V.

d. Remove board 2B from the chassis, insert an extender board in its place, and insert board 2B into the extender.

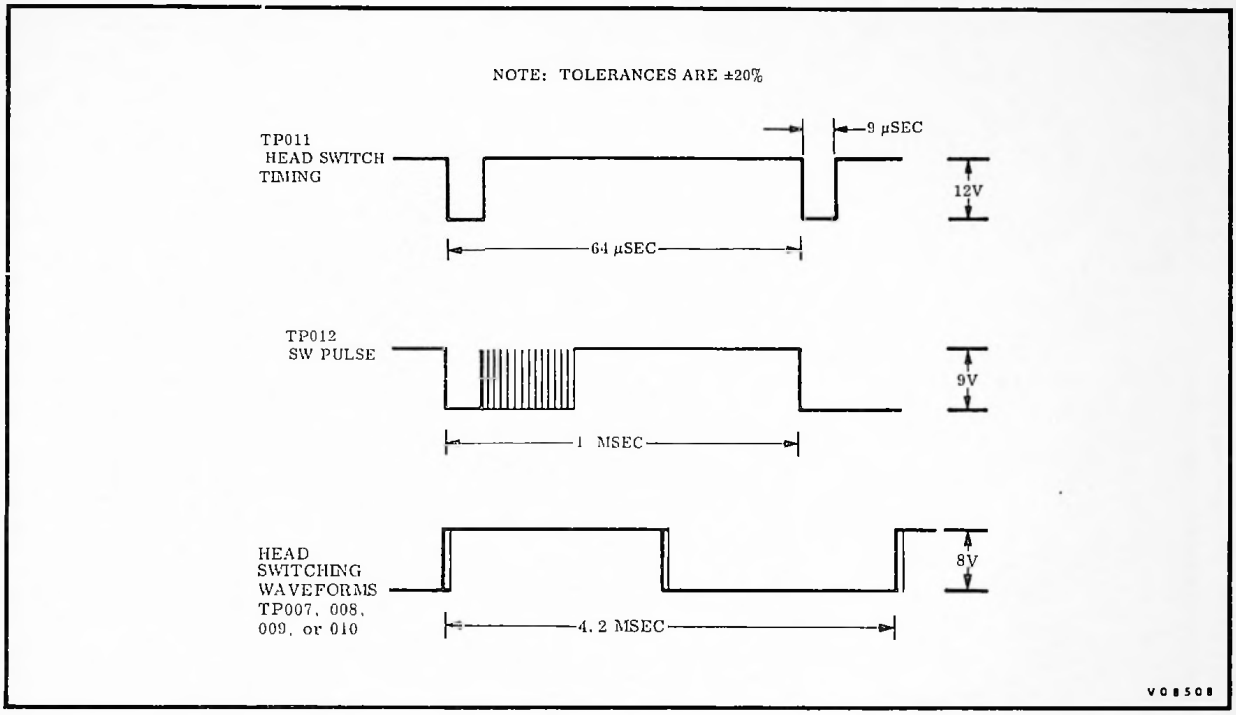


Figure 5.2-1. Input Timing Signal Waveshapes

e. Check the voltage between pin 10 and ground. It should be +3.65 (±0.05)V.

f. Using an oscilloscope, check combined noise and ripple at TP1 and TP2 of board 1. Combined noise and ripple should not exceed 20 mVp-p.

g. Check for combined noise and ripple at pin 10 of board 2. Combined noise and ripple should not exceed 20 mVp-p.

5.2–12 Vertical Drive Extender Performance Checks

These checks are designed to demonstrate the operational capability of the vertical drive extender. To perform the checks, connect a 10:1 probe to the vertical input of an oscilloscope, then proceed as follows:

a. Connect the probe to TP004 (system). A vertical drive signal should be present as shown in Figure 5.2-3.

b. Connect the probe to TP6, board 7, and externally sync the oscilloscope (+) from TP004 (system). The difference in duration of the pulses should be 144 (±9) Usec as shown in Figure 5.2-3.

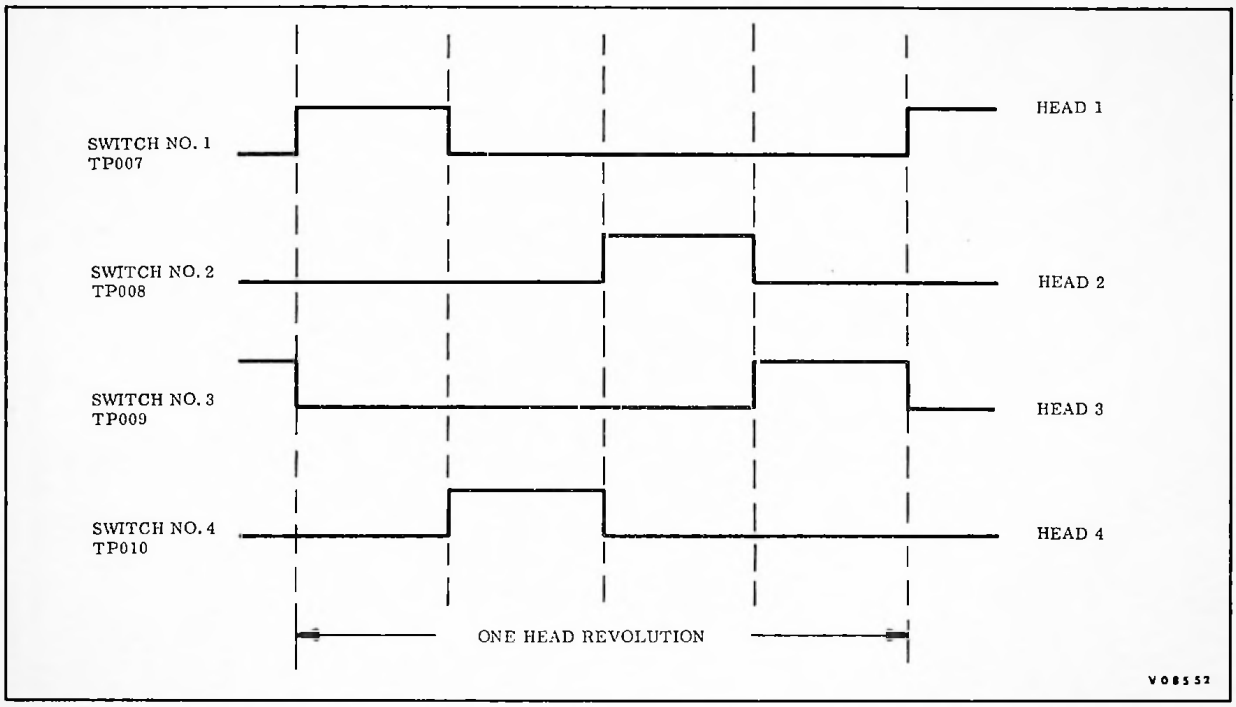


Figure 5.2-2. Head Decoder Input Waveshapes

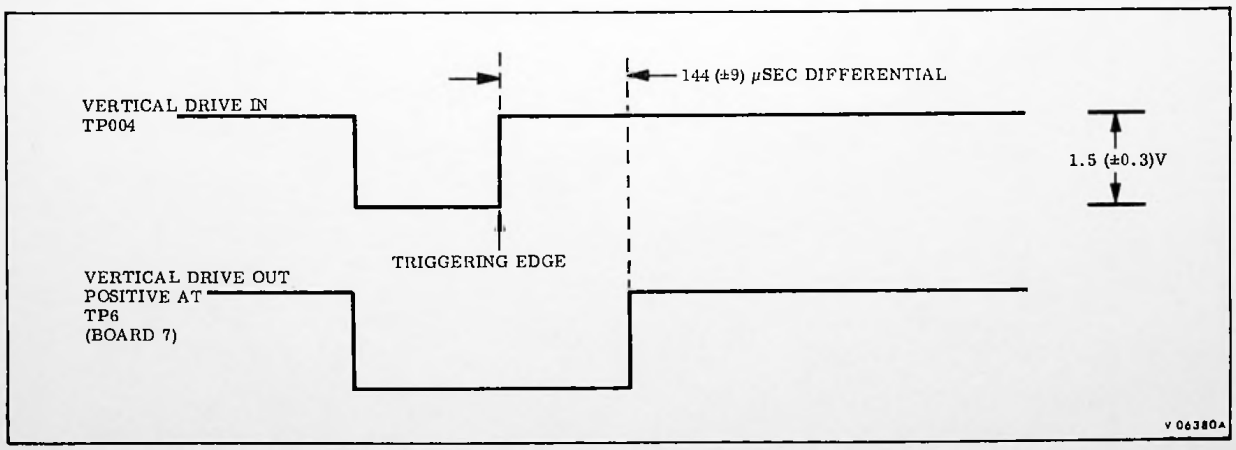


Figure 5.2-3. Drive Extender Pulse Duration Differential

5.2–13 Timing Generator Performance Checks

These checks demonstrate the operational capability of the timing generator (board 7). If any indication falls outside the tolerance listed, repair or replace the board. To perform the checks, proceed as follows:

a. Sync the oscilloscope internally (-).

b. Connect a 1:1 probe successively to test points TP1, TP2, TP3, and TP4, (board 7). The waveforms should resemble those of Figure 5.2-4.

c. Sync the oscilloscope externally from TP004 (system).

d. T4 should occur in groups of 16 (occasionally 17). Pulses should be absent during the vertical interval.

e. Connect the probe to TP5, board 7. The waveform should resemble that shown in Figure 5.2-5. T5 should be high during the vertical interval.

f. Sync the oscilloscope externally from TP011 (system). Starting times of T1 through T5 should be as shown in Figure 5.2-6.

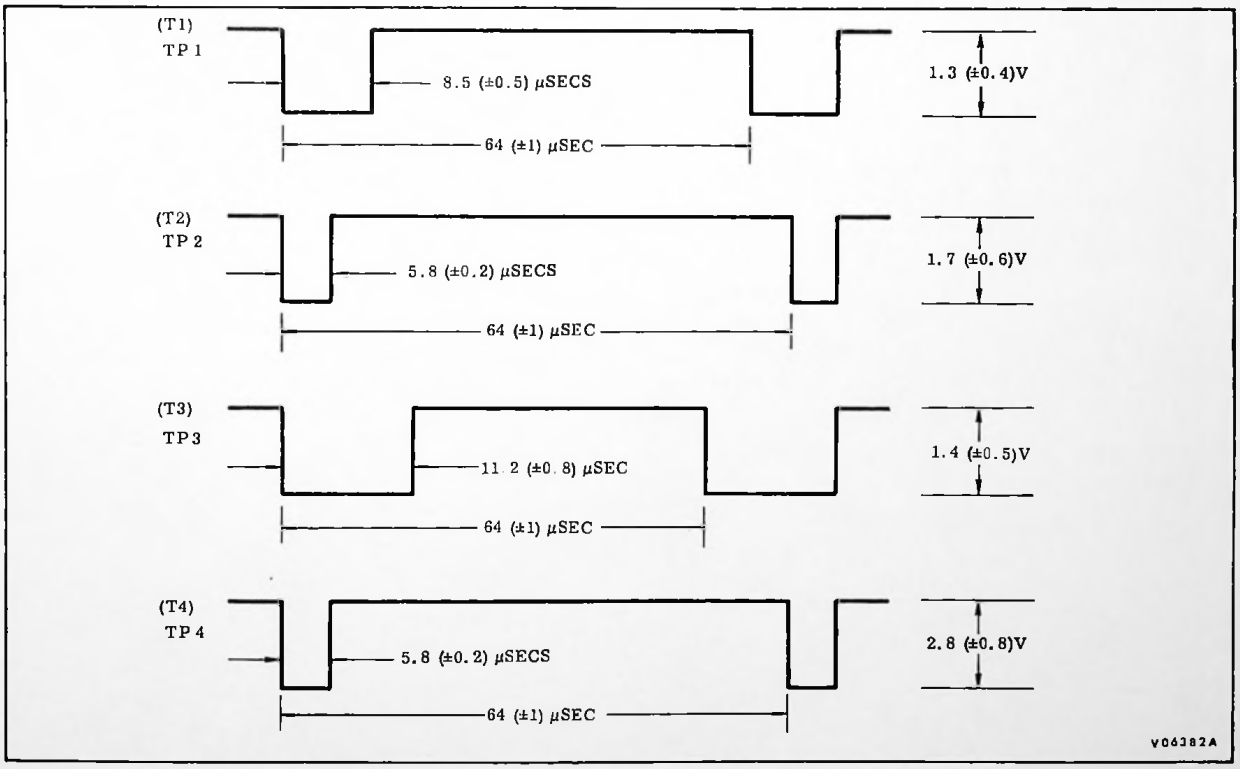


Figure 5.2-4. Timing Generator Outputs, T1, T2, T3, and T4

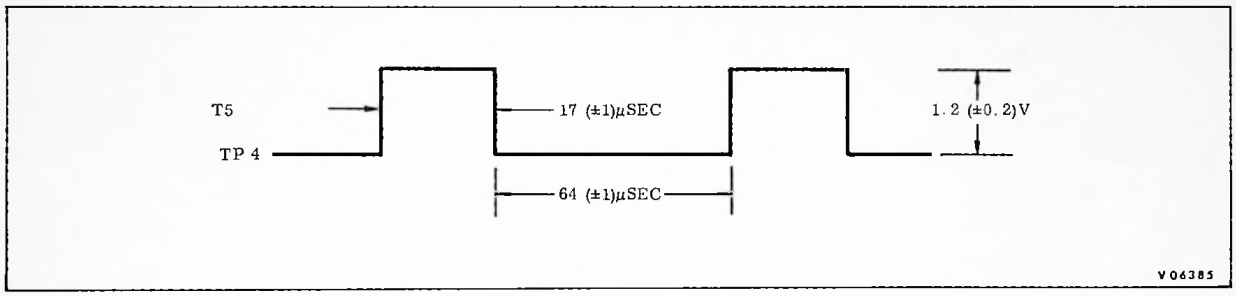


Figure 5.2-5. Timing Generator Output, T5

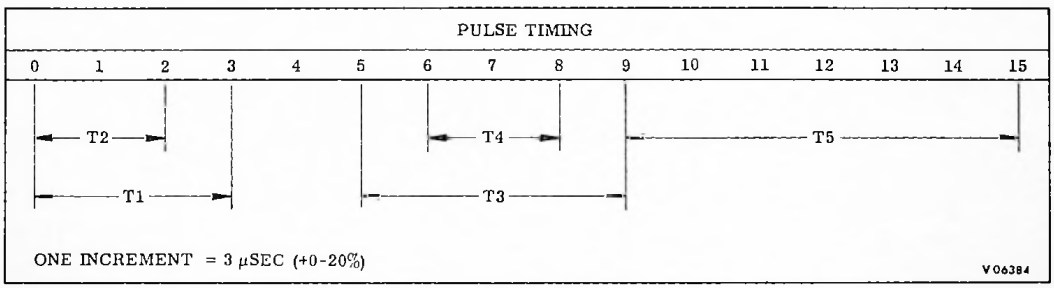


Figure 5.2-6. Pulse Timing Relationship, T1 through T5

5.2–14 Line Counter and Memory Board Performance Checks

5.2-15 These checks demonstrate the operational capability of the line counter circuits (boards 3, 4 and 5) and the memory circuits (board 2). These circuits are discussed in the same paragraph because of their close interrelationship.

5.2-16 If any indication falls outside the tolerance listed, repair or replace the board. To perform the checks, proceed as follows:

a. Externally trigger the oscilloscope (+) from TP012 (system). Connect the probe successively to test points TP1, TP2, TP3, and TP4 (board 5). The waveforms should resemble those shown in Figure 5.2-7.

b. Externally sync the oscilloscope (+) from TP3, board 6.

c. Connect the probe to TP1, board 2A. The waveform should resemble that shown in Figure 5.2-8.

NOTE

Pulse A is approximately 8 Usec wide, and pulse B approximately 11 Usec (±20%) wide. The distance between pulses is approximately 80 Usec, and the period is 4.2 (±0.2) msec. Amplitude is 1.2 Vp (±20%).

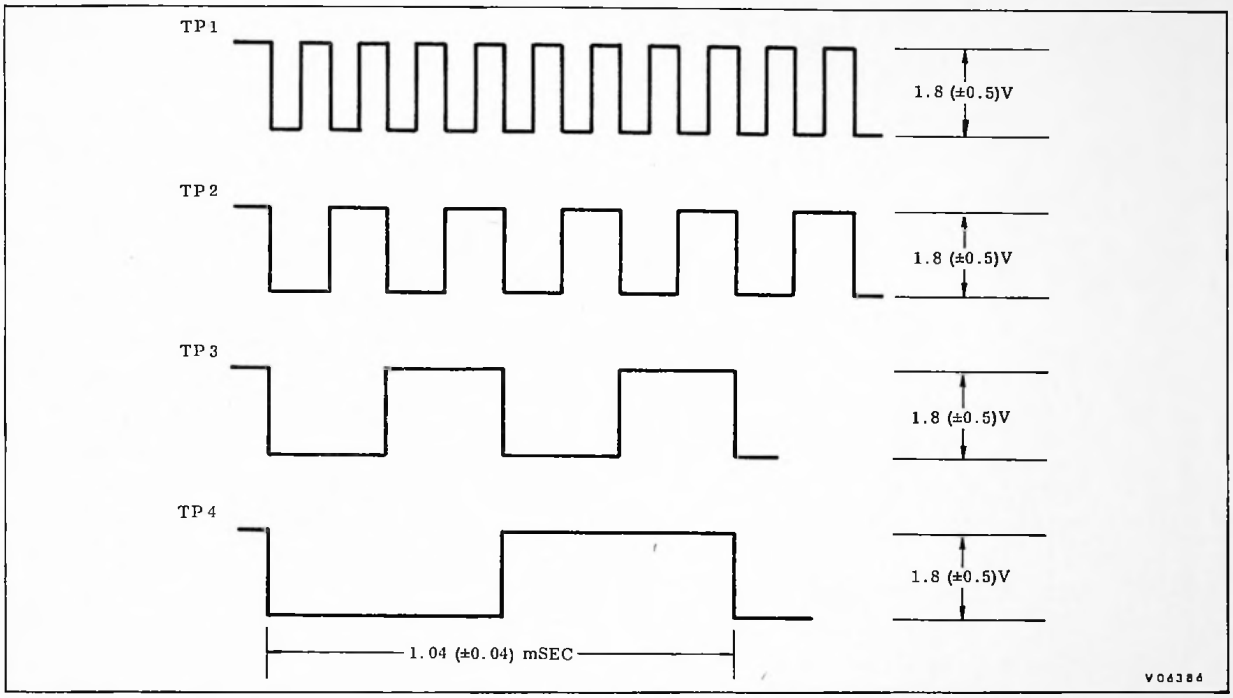


Figure 5.2-7. Line Counter Decoder Output

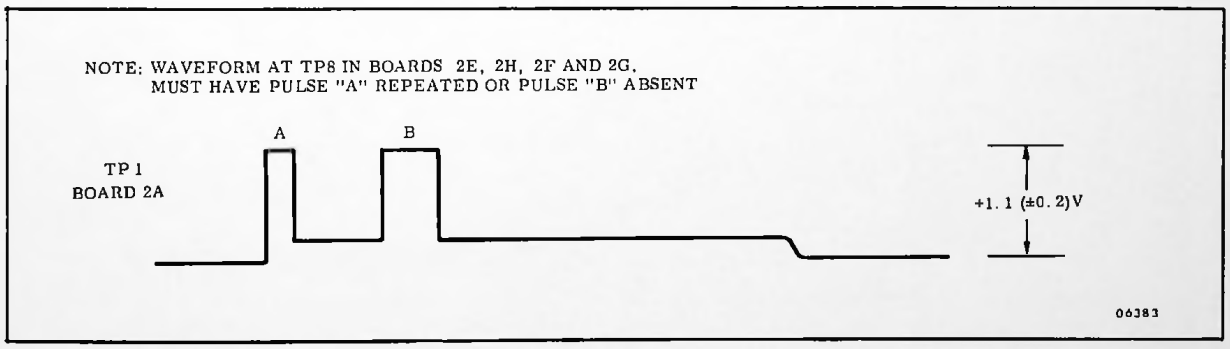


Figure 5.2-8. Typical Memory Board Pulse Train

d. Check the waveform at test points TP2 through TP8 (board 2A). Each successive pulse should occur one horizontal line (63.5 Usec) after the preceding one.

e. Perform the above checks for boards 2E, 2D, 2H, 2B, 2F, 2C and 2G.

NOTE

The oscilloscope should be sync'd from TP3 for board 2E, from TP1 for boards 2D and 2H, from TP4 for boards 2B and 2F, and from TP2 for boards 2C and 2G.

5.2-17 Head Decoder Performance Check

These checks demonstrate the operational capability of the head decoder (board 6). If any indication falls outside the tolerance listed, repair or replace the board. To perform the checks, sync the oscilloscope (-) from TP004 (system) and successively connect the probe to the indicated test outputs of board 6; waveforms should appear as shown in Figure 5.2-9.

5.2-18 Timing-Generator Driver Checks

These checks demonstrate the operational capability of the timing-generator driver (board 6). If any indication falls outside the tolerance listed, repair or replace the board. To perform the checks, proceed as follows:

a. Sync the oscilloscope externally (-) from TP011 (system), and connect the probe to TP5 of board 6. The waveform should resemble that shown in Figure 5.2-10.

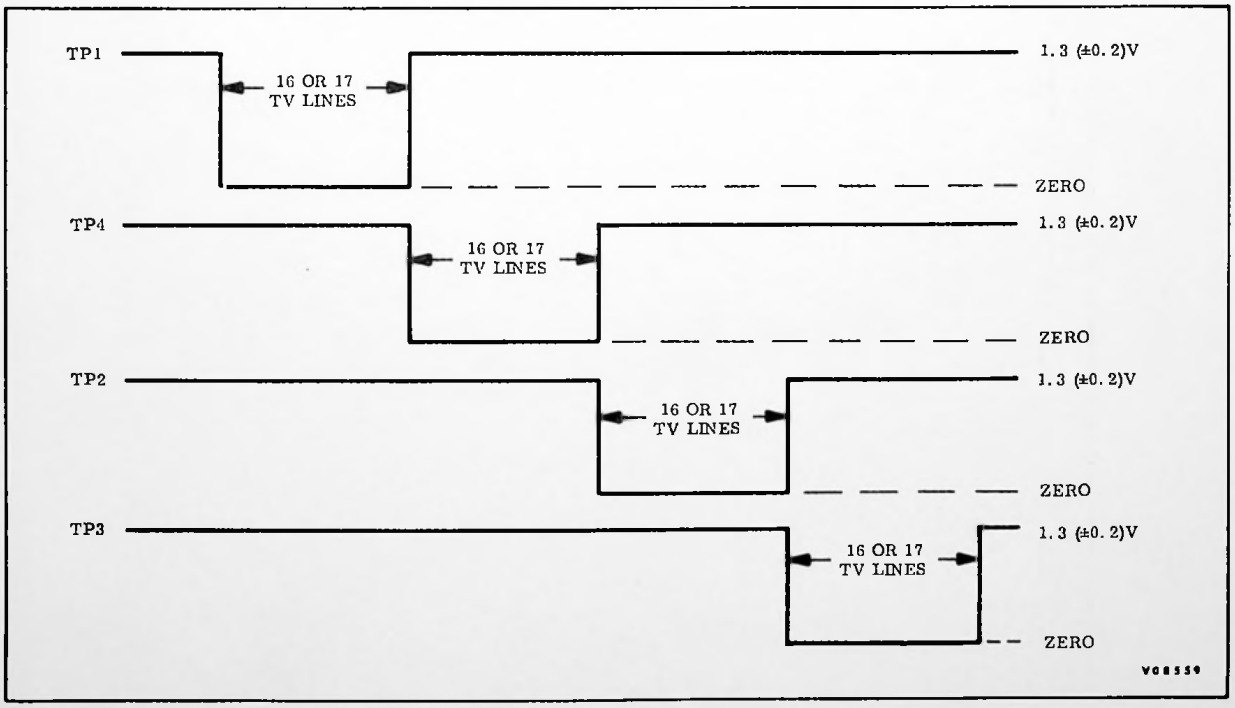


Figure 5.2-9. Head Decoder Output Waveforms

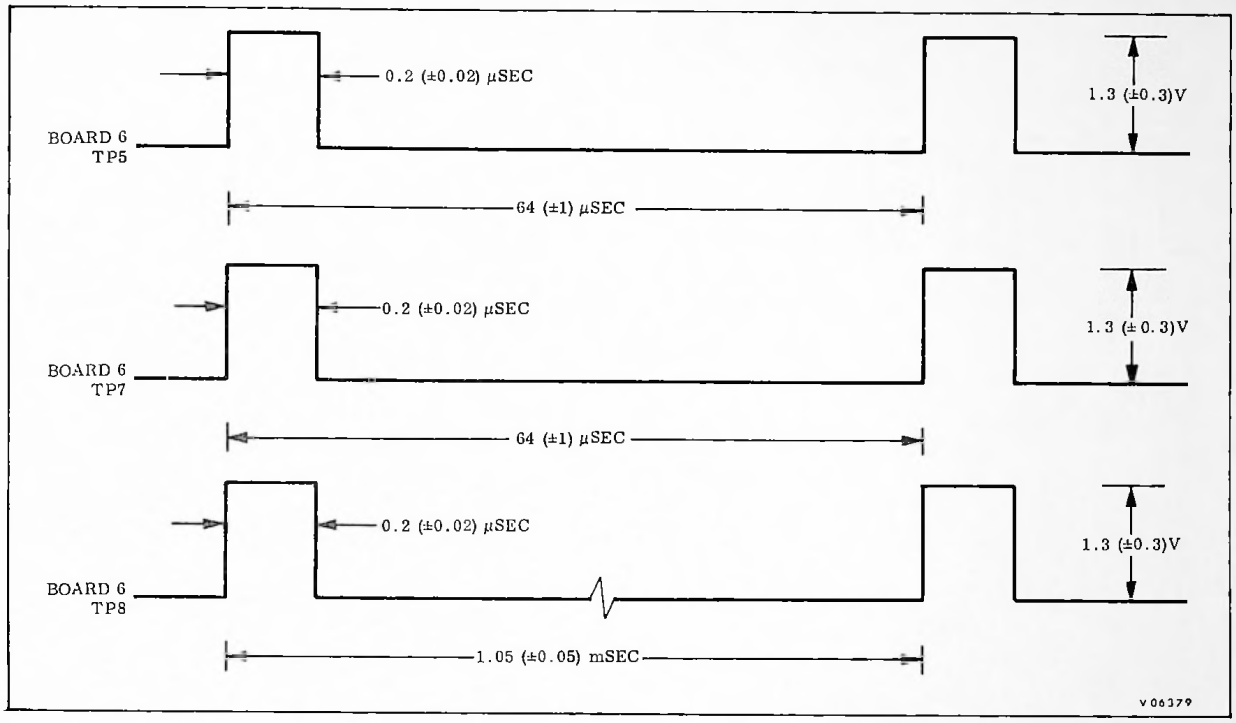


Figure 5.2-10. Timing Ring Output Waveform

b. Connect the probe to TP7 of board 6. The waveform should resemble that shown in Figure 5.2-10.

c. Connect the probe to TP8 of board 6. The waveform should resemble that shown in Figure 5.2-10.

d. Connect the probe to TP6. The waveform should resemble that of Figure 5.2-11.

e. Externally sync the oscilloscope from TP011 (system). Sixteen pulses should appear in every sweep period as shown in Figure 5.2-11.

5.2-19 ALIGNMENT AND ADJUSTMENT PROCEDURES

5.2-20 General

5.2-21 Alignment and adjustment procedures in the following paragraphs fall into two categories:

a. Post-installation procedures concerned with the overall system following installation.

b. Procedures concerned with individual boards, usually following performance checks.

5.2-22 If the adjustments described in the following paragraphs fail to achieve the

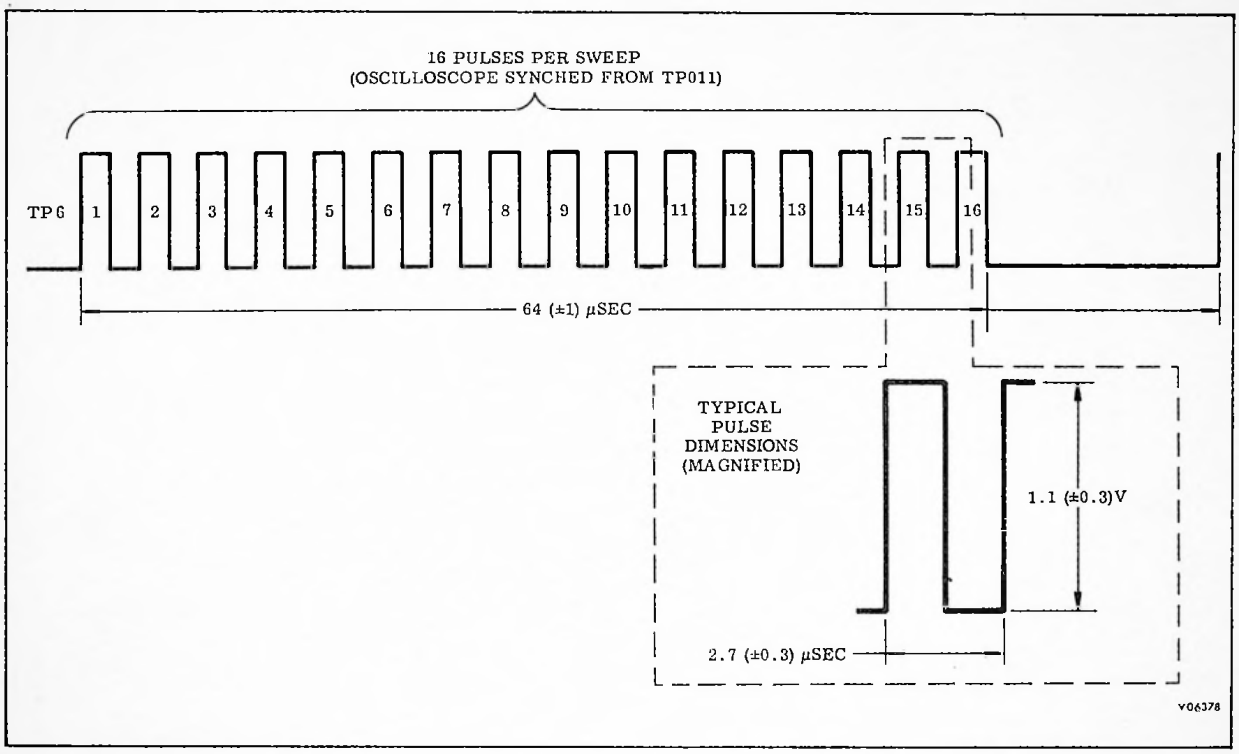


Figure 5.2-11. Timing Counter Drive Output

desired results, refer to the appropriate schematic and perform standard trouble-shooting and repair procedures.

5.2–23 Post-Installation Adjustment Procedures

5.2-24 The adjustment procedures of this paragraph must be performed to match the velocity compensator to the Colortec and Amtec accessories. Perform the adjustment as follows:

a. Play back a color test-signal, taking care to achieve the best possible signal-to-noise ratio.

b. Set the VELOCITY COMPENSATION switch to ON.

c. Trigger an oscilloscope from the negative-going edge of the pulse present at TP1, board 6. Adjust the sweep rate for 20 Usec/division and for vertical sensitivity of 0.5V/division.

d. Observe the amplified subtracter-pulse waveform present at TP2, board 9, with attention directed to the first pulse following the switching transient which occurs at sweep triggering time (see Figure 5.2-12). This pulse is associated with the second picture line in head band number 1.

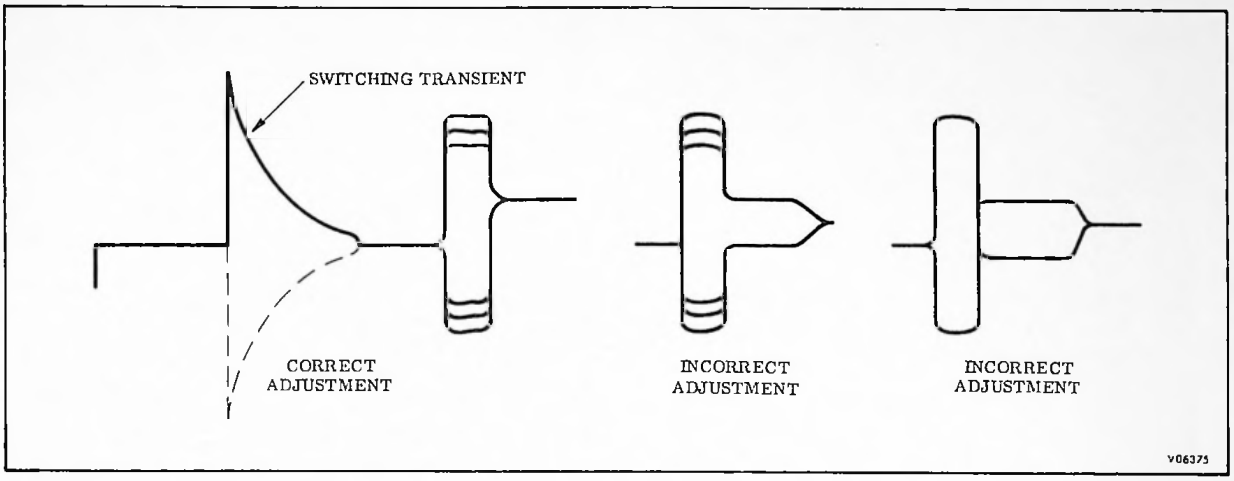


Figure 5.2-12. Waveform for Colortec Gain Adjustment

e. Set the transport suppression switch on the vtr to off, and make a slight adjustment of the tip engagement, so that the early portion of the pulse is randomly modulated in height.

NOTE

This first portion of the pulse is the differentiated Amtec error-signal, and the large random modulation of the signal is caused by interference with the leading edge of sync by the unsuppressed head switching transient. The latter portion of the pulse is the same, except that the Colortec error-component has been added to cancel the modulation caused by false sync timing. Therefore, when the proportion of the Colortec and Amtec error is correct, the large excursions should be removed from the latter portion of the pulse, and only those caused by random noise should remain.

f. Rotate R59 of board 9 through its complete range, and then set it at the point where excursions of the latter portion of the pulse are smallest.

5.2-25 The following steps describe an alternate method of making the adjustments to board 9:

a. Play back a pre-recorded tape of color bar test signals (preferably a reference tape). The tape must be of high quality, with a high signal-to-noise ratio.

b. Adjust the guide height and tip projection on the head assembly to minimize time-base errors.

c. Make any signal system adjustments required to obtain a playback signal with a high signal-to-noise ratio.

d. Turn the Amtec mode selector to CTL OFF. Set the Colortec mode selector to STD COLOR.

e. With the guide height or tip projection controls, introduce a small amount of time-base error.

NOTE

This error must not exceed the correction capabilities of the Colortec accessory (±280 nsec). The error will be at head-rotation rate (240 or 250 Hz).

f. Adjust variable resistor R59 on velocity compensator board 9 to obtain the optimum correction (i.e. color picture with minimum color hue shift or other evidence of velocity error) in the display on a color monitor.

g. Return the Amtec mode selector to its original position.

5.2-26 Individual Board Adjustment Procedures

5.2-27 AMTEC DC LEVEL AND GAIN ADJUSTMENT (BOARD 8). For the measurements discussed in this paragraph, use an oscilloscope with a differential preamplifier (Tektronix type Z, or equivalent), and two 1:1 probes. Set the vertical amplifier controls to DC, A-B DIFF, and maximum sensitivity; and time base to 2 milliseconds/division. Trigger the oscilloscope externally (-) from TP004 (system). Play a pre-recorded tape, introducing a small time-base error by misadjusting the female guide and proceed as follows:

a. Set the VELOCITY COMPENSATION switch to OFF.

b. Connect one test probe to Amtec test point TP0602, and the other probe to velocity compensator system test-point TP003.

c. Adjust velocity-compensator R36 (board 8) to 0V difference. The waveform should resemble A or B of Figure 5.2-13.

d. Adjust R68 (AMTEC GAIN, board 8) for zero slope. If necessary, readjust R36 for 0V difference.

5.2-28 RAMP GENERATOR BALANCE ADJUSTMENT (BOARD 8). For the measurements discussed in this paragraph, use an oscilloscope with a differential preamplifier and two 1:1 probes. Set the vertical amplifier controls to DC, A-B DIFF, and maximum sensitivity; and time base to 2 milliseconds/division. Trigger the oscilloscope externally (-) from TP004. Play a pre-recorded tape and proceed as follows:

a. Disconnect the cables to J7 (AMTEC ERROR SIGNAL) and J4 (COLORTEC ERROR SIGNAL) from the velocity compensator.

b. Connect one oscilloscope probe to TP3 (board 8).

c. Set the VELOCITY COMPENSATION switch to ON.

d. Rotate R35 (board 8) from one stop to the other. Waveforms similar to those shown in Figure 5.2-13 should be seen, with T = 63.5 Usec.

e. Adjust R38 for zero slope. The waveform should resemble Figure 5.2-14.

f. Reconnect the AMTEC ERROR SIGNAL cable to J7, and the COLORTEC ERROR SIGNAL cable to J4.

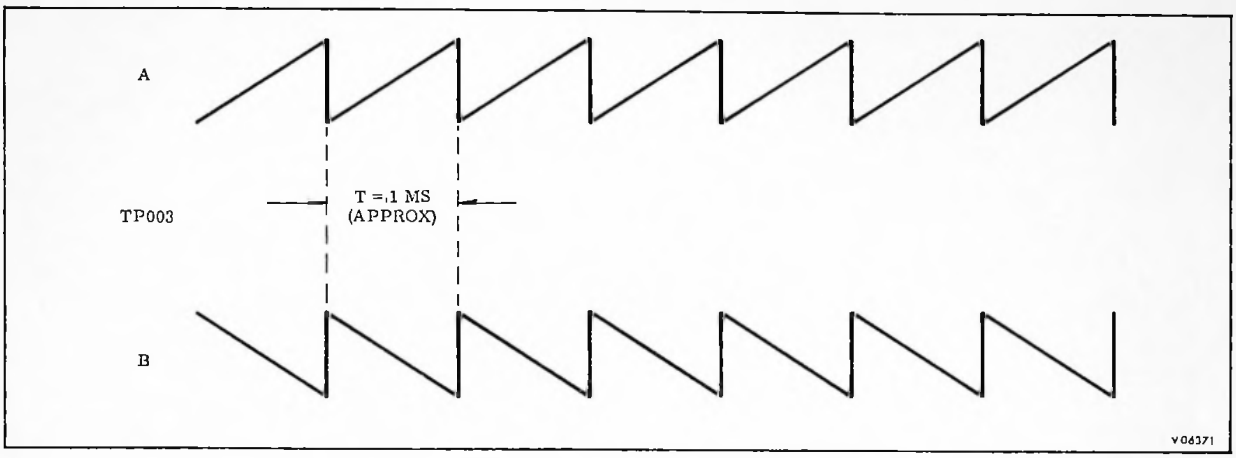


Figure 5.2-13. Waveform for Amtec DC Level and Gain Adjustment

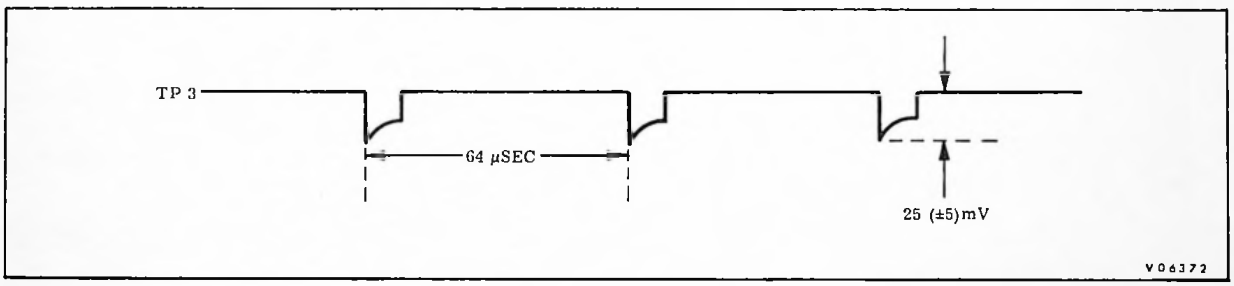


Figure 5.2-14. Ramp Generator Balance Adjustment

5.2-29 RAMP GENERATOR GAIN AND RESET CLAMP ADJUSTMENTS (BOARD 8). For measurements discussed in this paragraph, use an oscilloscope with a 1:1 probe. Play back a pre-recorded tape with the vtr in HORIZONTAL mode and proceed as follows:

a. Connect the probe to TP001 (AMTEC ERROR SIGNAL IN) of the velocity compensator.

b. While watching the signal from TP001, adjust the vtr TIP PROJ control for an error voltage of 0.75 Vp-p.

c. Connect the probe to TP002 (COLORTEC ERROR SIGNAL IN) of the velocity compensator and check for the presence of Colortec error waveform.

d. Connect the probe to TP003 (system) of the velocity compensator.

e. Adjust R50 (board 8) for a waveform approximating that of Figure 5.2-15.

f. Reset the vtr TIP PROJ control to the proper setting.

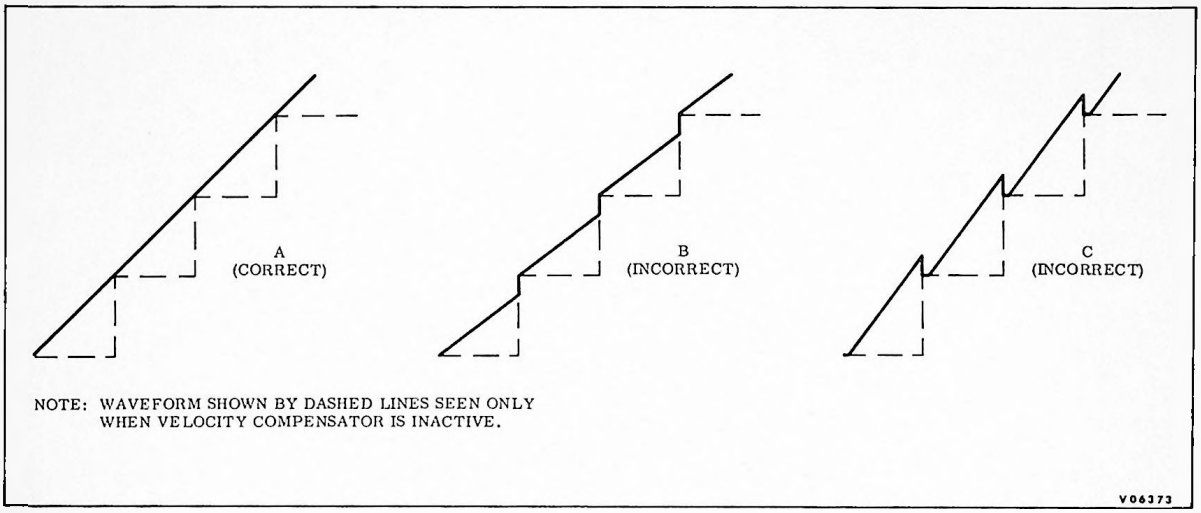


Figure 5.2-15. Waveform for Ramp Generator Gain Adjustment

g. Connect the probe to TP002 (AMTEC ERROR SIGNAL IN) of the velocity compensator.

h. Adjust the guide height control on the head assembly for maximum error output.

i. Observe the negative-sloped waveform. If the corners are not perfectly joined, readjust R50 (board 8) for the best possible compromise between positive and negative slope.

j. Connect the probe to TP014. Check for operation of all 64 memory cells by observing that the Amtec accessory error waveform is being properly corrected for four head-passes.

5.2-30 AMTEC ERROR DETECTOR ADJUSTMENTS (AMTEC BOARD 6). For measurements discussed in this paragraph, use an oscilloscope with a 1:1 probe. The following adjustments to the Amtec accessory need be made only if components are replaced in the velocity compensator or Amtec accessories. Two alternate methods are given.

5.2-31 Adjust the error detector as follows:

a. Mount Amtec board 6 on an Amtec extender board in the proper position.

b. Turn the recorder system power on; set the Amtec mode selector to NORMAL. Be sure the recorder is supplied with a video input signal.

c. Set the oscilloscope for external triggering; trigger from TP006 on the Amtec test panel.

d. Set the oscilloscope sweep rate to 0.2 Usec/division and the vertical sensitivity to 0.2 V/division.

e. Connect the oscilloscope probe to terminal E1 on board 6; adjust resistor R1 for zero slope on the 2 Usec shelf (see Figure 5.2-16).

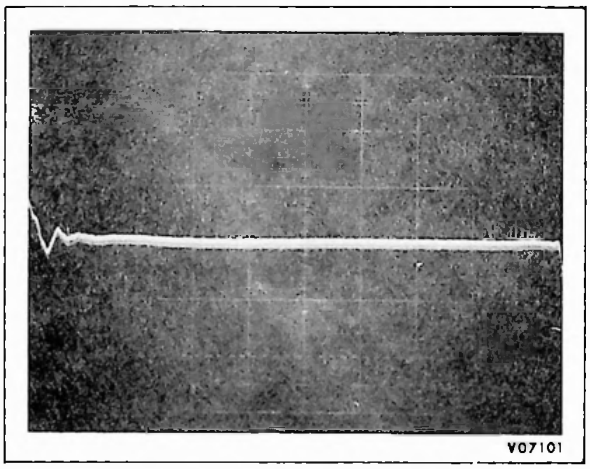


Figure 5.2-16. Amtec Error Detector Display

f. Place the oscilloscope probe in test point TP1 on board 7, and ensure a dc voltage level of zero. If necessary, adjust inductor L3 on board 7. The dc must be free of high-amplitude noise. (Noise is indicative of an unlocked oscillator.)

g. Adjust resistor R43 on board 6 for precise centering of the Amtec CONTROL VOLTAGE meter.

h. Set the oscilloscope sweep rate to 2 Usec/division and the vertical sensitivity to 0.05 V/division; trigger internally.

i. Connect one end of a 33 kilohm resistor to terminal E3 of board 6. The other end of this resistor will be switched between +12V and -12V; +12V may be picked up at pin K of the board connector, and -12V may be picked up at pin M.

j. Place the oscilloscope probe in test point TP2 of board 6; observe the waveform while alternating the free end of the resistor between + and -12V.

k. Adjust inductor L1 on board 6 for minimum crosstalk (see Figure 5.2-17).

l. Remove the 33 kilohm resistor.

m. If necessary, re-adjust resistor R43 on board 6 to center the Amtec CONTROL VOLTAGE meter.

n. Leave the oscilloscope probe in test point TP2. Set the sweep rate to 50 Usec/division and the vertical sensitivity to 0.02 V/division.

o. Adjust resistor R44 for zero slope (flattest line-to-line voltage). See Figure 5.2-18.

5.2-32 The following steps describe an alternate method of adjusting the error detector:

a. Mount Amtec board 6 on an Amtec extender board in the proper position.

b. Turn the recorder system power on; set the Amtec mode selector to NORMAL. Be sure the recorder is supplied with a video input signal.

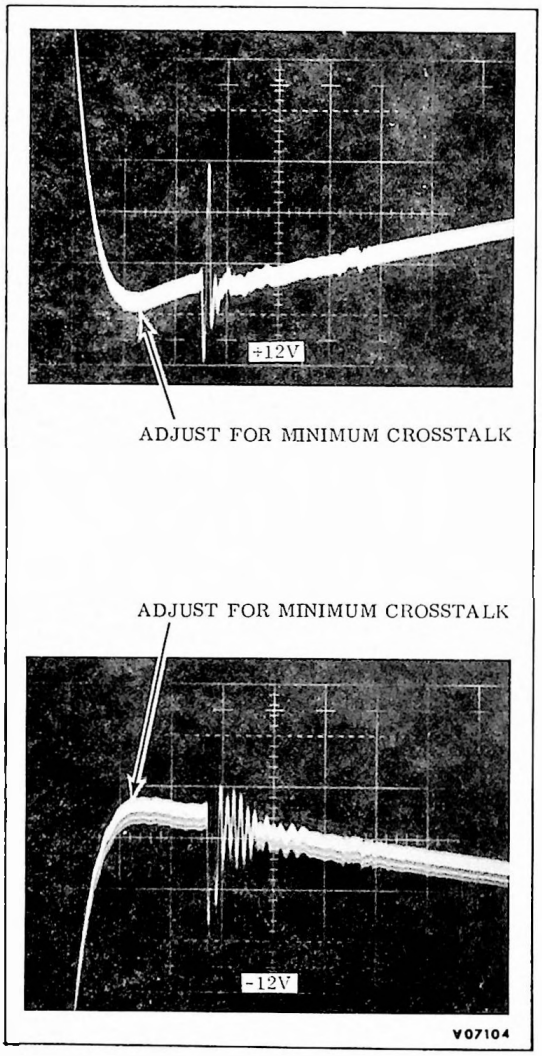


Figure 5.2-17. Crosstalk Elimination Display

c. Connect the oscilloscope probe to TP006 on the Amtec test panel; trigger it internally.

d. Set the oscilloscope sweep rate to 1 Usec/division and the vertical sensitivity to 0.5 V/division.

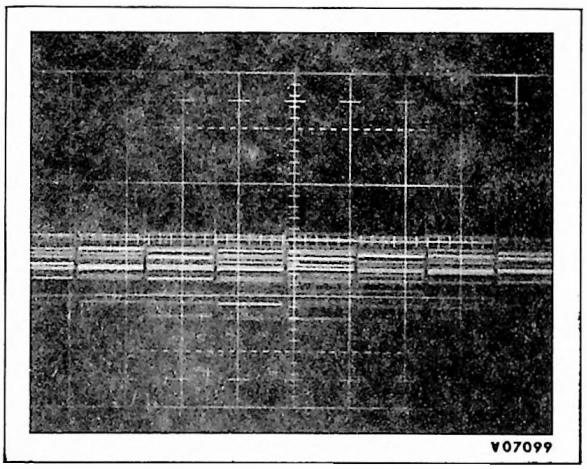


Figure 5.2-18. Line Slope Display

e. Adjust resistor R1 on board 6 for minimum crosstalk. Figure 5.2-19 shows a display of the correct and incorrect signals.

f. Perform steps f through o of paragraph 5.2-31.

5.2-33 AMTEC CORRECTION GAIN ADJUSTMENT (AMTEC BOARD 6). The following procedure, which is similar to the post-installation procedure in Chapter 2, should be performed if components are replaced within the velocity compensator or Amtec accessories:

a. Perform the adjustments delineated in paragraph 5.2-31.

b. Set the Amtec mode selector to FAST.

c. Record and play back a color test signal; during playback, use the Amtec, Colortec, and velocity compensator accessories in the modes appropriate for color reproduction.

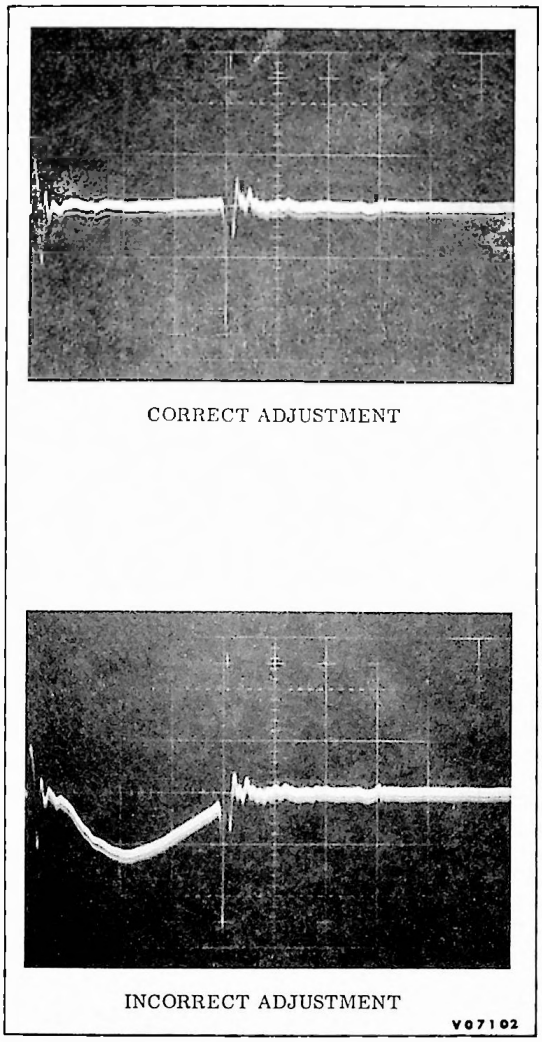


Figure 5.2-19. Amtec Error Crosstalk Display

d. Adjust the Amtec EXT REF POSITION control for a zero center reading on the CONTROL VOLTAGE meter.

e. Adjust the guide height and tip projection controls of the head assembly to eliminate geometric errors (scalloping and/or skewing).

f. Set the recorder WAVEFORM MONITOR selector to AMTEC ERROR and the waveform monitor INPUT selector to B.

g. Using the Intersync servo HORIZONTAL STABILITY controls, introduce a low-frequency time-base error of about 0.5 Usec p-p (1/2 of full scale on the waveform monitor) at field rate (60 or 50 Hz) or head-rotation rate (240 or 250 Hz). The amount of error introduced must not exceed the Amtec correction range.

h. Set the recorder WAVEFORM MONITOR selector to COLORTEC ERROR. A residual low frequency error signal of the same shape as that seen in the Amtec error signal may be seen; this is indicative of improper correction gain.

i. Adjust variable capacitor C7 on Amtec board 6 to cancel this error component in the Colortec error signal.

j. If the adjustment of C7 alone does not eliminate the error component, perform the following steps:

1. Set C7 to the center of its range.
2. Remove fixed capacitor C3 from board 6 (C3 is a shunting capacitor for C7).
3. Choose a value for C3 which eliminates or almost eliminates the error component. (The velocity compensator kit includes a selection of capacitors up to 1000 pF).

4. Adjust C7 to completely eliminate the error component.

5. Solder the selected capacitor in place, then re-adjust C7.

k. Repeat steps f and g of paragraph 5.2-31.

5.2-34 System Test Points

Test points TP001 through TP005 and TP007 through TP014 (see Figure 5.2-20), which are used during overall performance testing, are mounted on a panel at the right side of the velocity compensator and are accessible when the chassis is extended from the recorder cabinet. Test point TP006 is not used.

5.2-35 Timing Diagrams

5.2-36 LINE COUNTER (BOARD 5). Figure 5.2-21 is a timing diagram of board 5. The voltage levels are approximate; a logic element in the low condition will have an output of approximately zero volt. When the element is high, the level will be between 2 and 2.5 volts (approaching the 3.6 volt power supply). These waveforms will appear as shown only if the board is operating properly.

5.2-37 TIMING GENERATOR (BOARD 7). Figure 5.2-22 is a timing diagram of board 7. The voltage levels are approximate; a logic element in the low condition will have an output of approximately zero volt. When the element is high, the level will be between 2 and 2.5 volts (approaching 3.6 volt power supply). These waveforms will appear as shown only if the board is operating properly.

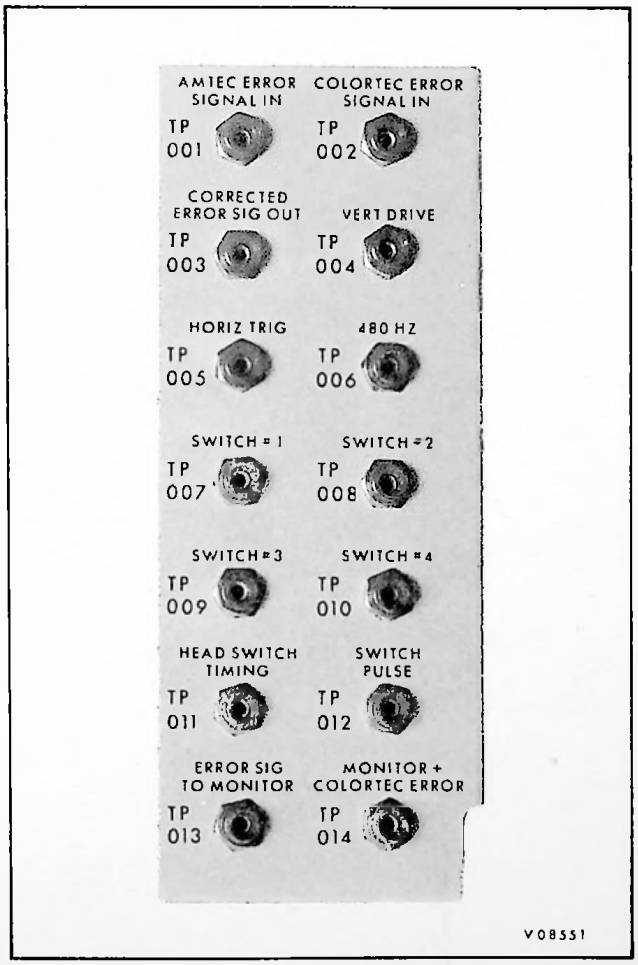
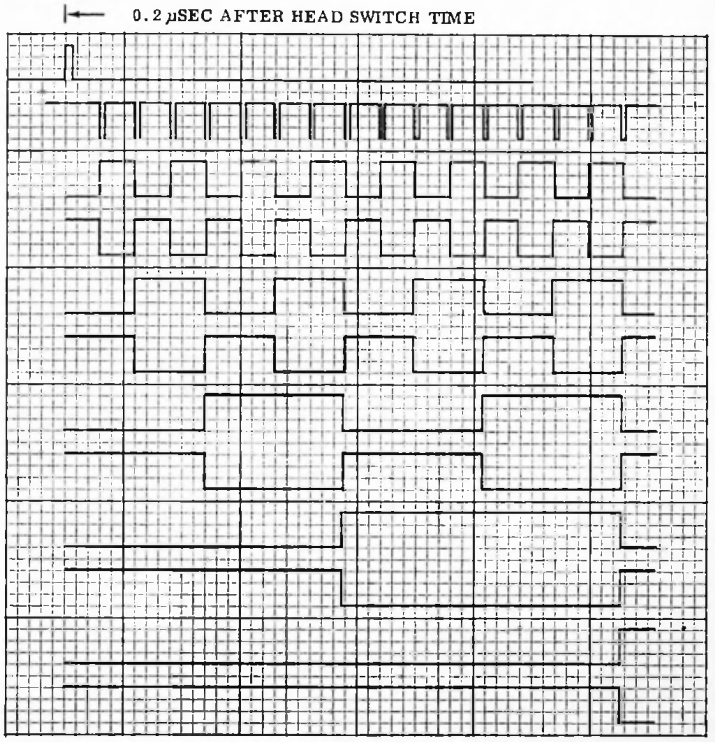


Figure 5.2-20. System Test Points

LOGIC ELEMENT	PIN NO.
A22	5
A1	5
A6	5
A7	5
A10	5
A11	5
A15	5
A16	5
A19	5
A20	5
A18	7
A18	9



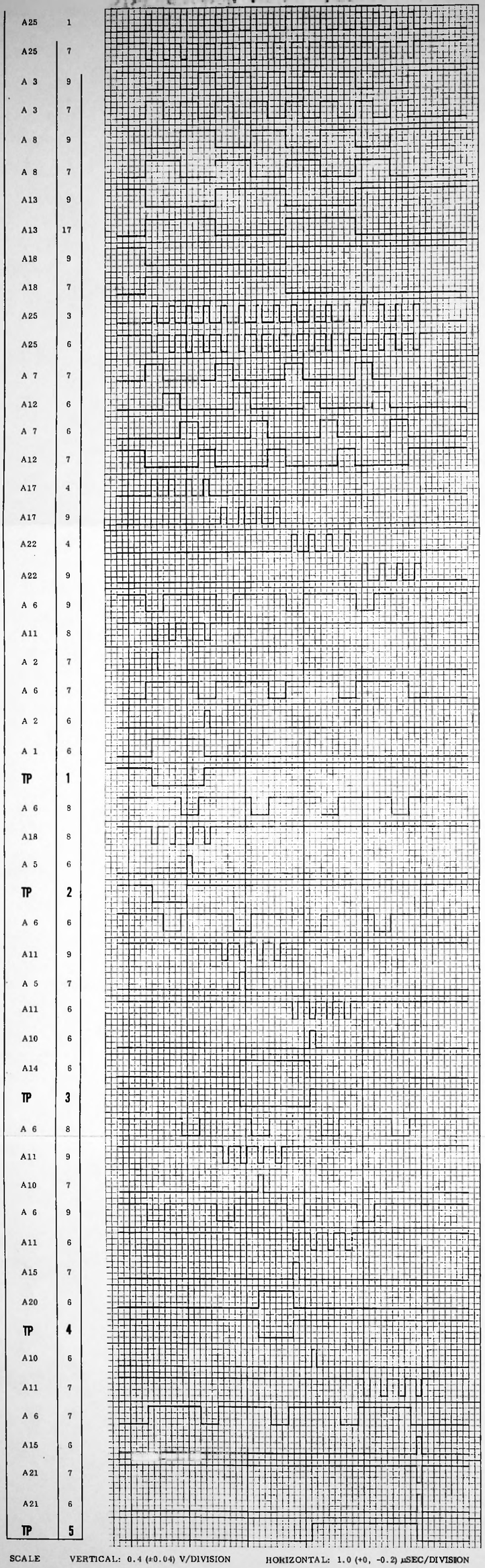
SCALE (±.08)

VERTICAL: 0.4 V/DIVISION

HORIZONTAL: 3 DIVISIONS = 63.5 µSEC

V07148

Figure 5.2-21. Line Counter Timing Diagram (Board 5)



SCALE VERTICAL: 0.4 (±0.04) V/DIVISION HORIZONTAL: 1.0 (+0, -0.2) μSEC/DIVISION

NOTES

1. ELEMENTS IN BOLD TYPE ARE TEST POINTS
2. PULSE T5 (AT TP-5) IS TRIGGERED UP BY:
   a. A10-6
   b. THE BEGINNING OF EVERY FIRST LINE AFTER HEAD SWITCHING
   c. EXTENDED VERTICAL DRIVE
3. PULSE T5 (AT TP-5) IS TRIGGERED DOWN BY A15-6 EXCEPT DURING EXTENDED VERTICAL DRIVE
4. PULSE T4 (AT TP-4) IS INHIBITED WHEN T5 IS UP

V07149

Figure 5.2-22. Timing Generator Timing Diagram (Board 7)

AMPEX

CHAPTER 6

SCHEMATIC DIAGRAMS, ASSEMBLY DRAWINGS, AND LIST OF MATERIALS

INTRODUCTION

This chapter is divided into three sections, Section I, SCHEMATIC DIAGRAMS, Section II ASSEMBLY DRAWINGS AND LISTS OF MATERIALS, and Section III INSTALLATION KIT SUPPLEMENTARY DATA. The format, purpose, and method of using the material in each section is described in the following paragraphs.

This introduction describes the arrangement of the material in the chapter and the use and relationship of the schematic diagrams, assembly drawings, and the lists of materials (lm's).

Section I contains all the necessary schematic diagrams. When applicable, a note on the schematic will reference it to the appropriate assembly drawing. The section has its own cross-referenced index. The index is in two parts, one that lists the schematic drawings alphabetically and one that lists them in numerical sequence. Each listing is cross-referenced to the appropriate assembly number. Alphabetical listings are in direct-reading order (i.e., High Gain Amplifier, not Amplifier, High Gain).

For use in identifying and ordering parts, Section II contains all the necessary assembly drawings and lists of materials for the equipment. The drawings and lm's are also cross-reference indexed in the manner described above.

Each item of a typical LM is explained below. The key number preceding each item corresponds to the same key number on the sample LM, shown in Figure 6.0-1.

1 Assembly Title. This is the title assigned the assembly by the Ampex Engineering Department.

2 Catalog Number of Assembly. This number corresponds to the number stamped on, or affixed to, the assembly during manufacture.

3 Item Number. This number is assigned to parts to aid in identifying and locating the parts on the LM or assembly drawing.

4 Ampex Part Number. These are Ampex's document and part control numbers.

5 Vendor or Military Number. This is the identification number that Ampex used to purchase the part from a vendor. Any suitable equivalent may be used in the procurement of parts so identified.

6 Schematic Reference. This number is assigned to electrical components on the schematic drawings.

7 Part Description. This is an abbreviated explanation of each part used in the complete assembly, to assist the user in identifying parts. Where the same part is listed more than one time on an LM, the statement "Same as ------" will be given, and refers to the description given for the first listing of the part.

8 Quantity Required Per Version. This number indicates the quantity of each part required in the complete assembly.

9 Sheet _ of _. This figure indicates the number of pages comprising the complete list of materials for the assembly.

10 Date. This area of the page will contain the date that the LM has been changed or revised. Where no changes have occurred, there will be no date given.

11 Control Number. This is for Ampex Corporation use only.

12 Page Number. This is the page number assigned to each page, as listed in the indexes. In the sample page number 6.3-4, the 6 signifies Chapter 6, the .3 signifies the third section of Chapter 6, and the -4 indicates the fourth page of Section 3.

Figure 6.0-2 illustrates how to find a part number or name by cross-referencing the item key numbers between the LM's and the assembly drawings and schematic diagrams.

CHOPPER OSCILLATOR ASSEMBLY (1) (2) CATALOG NO. 1800276 (9) Sheet 1 of 2

(3) ITEM NO	AMPEX PART NO (4)	VENDOR OR MIL. NO. (5)	SCHEMATIC REFERENCE (6)	PART DESCRIPTION (7)	QUANTITY REQUIRED PER VERSION -01 (8)
2	1208395-10			PRINTED WIRING BOARD ASSEMBLY	1
3	1202583-10			SCREW, Module	2
4	1202584-40			PANEL, Housing	1
6	6000022-10			LABEL, Identification	1
8	087-061			GREASE, #7 silicon	A/R
9	014-990	2N1540	Q7, 8	TRANSISTOR	2
10	150-142			SOCKET, Transistor Mounting	2
11	430-075			RING, Retain[illegible]	2
12	471-063			SCREW, P[illegible] 4-40 x 7/16	4
13	471-061			SCREW [illegible] 4-40 x 5/16	4
14	471-068			SCR[illegible] ps, 6-32 x 5/16	4
16	496-004			N[illegible]	8
18	501-096			[illegible]6 ID	2
19	502-003			[illegible], Lock #6	4
20	503-019			[illegible]at, phenolic #6	4
22	1208396			[illegible]IC	REF

CHANGED 1 OCTOBER 1964 (10)

1800276 (11)

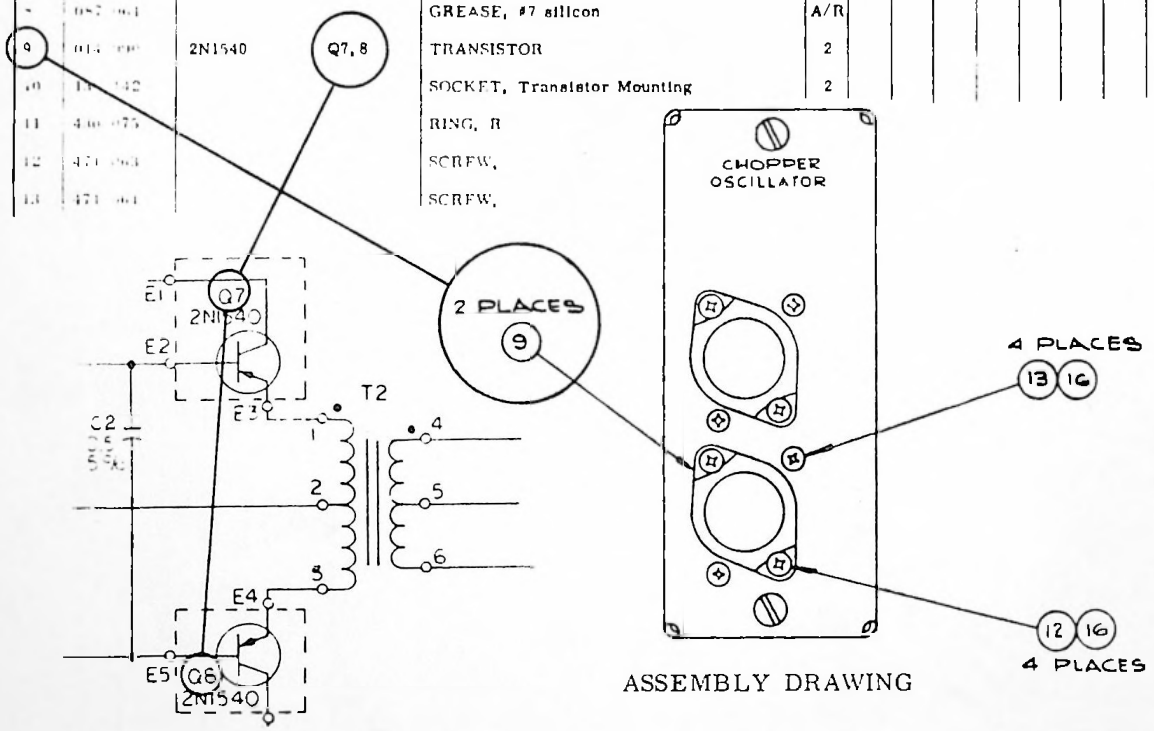
6.3-4 (12)

Figure 6.0-1. Example of List of Materials

LIST OF MATERIALS

CHOPPER OSCILLATOR ASSEMBLY — CATALOG NO. 1800276 — Sheet 1 of 2

ITEM NO.	APEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	QUANTITY REQUIRED PER VERSION -01
2	120S395-10		PWB1	PRINTED WIRING BOARD ASSEMBLY	1
3	120[illegible]-10			SCREW, Module	2
4	120[illegible]-40			PANEL, Housing	1
6	[illegible]			LABEL, Identification	1
[illegible]	[illegible]			GREASE, #7 silicon	A/R
9	[illegible]	2N1540	Q7, 8	TRANSISTOR	2
10	[illegible]			SOCKET, Transistor Mounting	2
11	[illegible]			RING, R	
12	[illegible]			SCREW,	
13	[illegible]			SCREW,	



ASSEMBLY DRAWING

SCHEMATIC

Figure 6.0-2. Using the List of Materials

SECTION I

SCHEMATICS

The circuit of boards 2 through 7 are composed largely of integrated components. These components are represented on the diagrams by the symbols assigned by the manufacturer. To find the logic function of the component, refer to the small auxiliary drawings located on the edge of each schematic. Table 6.1-1 lists logic functions for all integrated components used in the velocity compensator.

NOTE

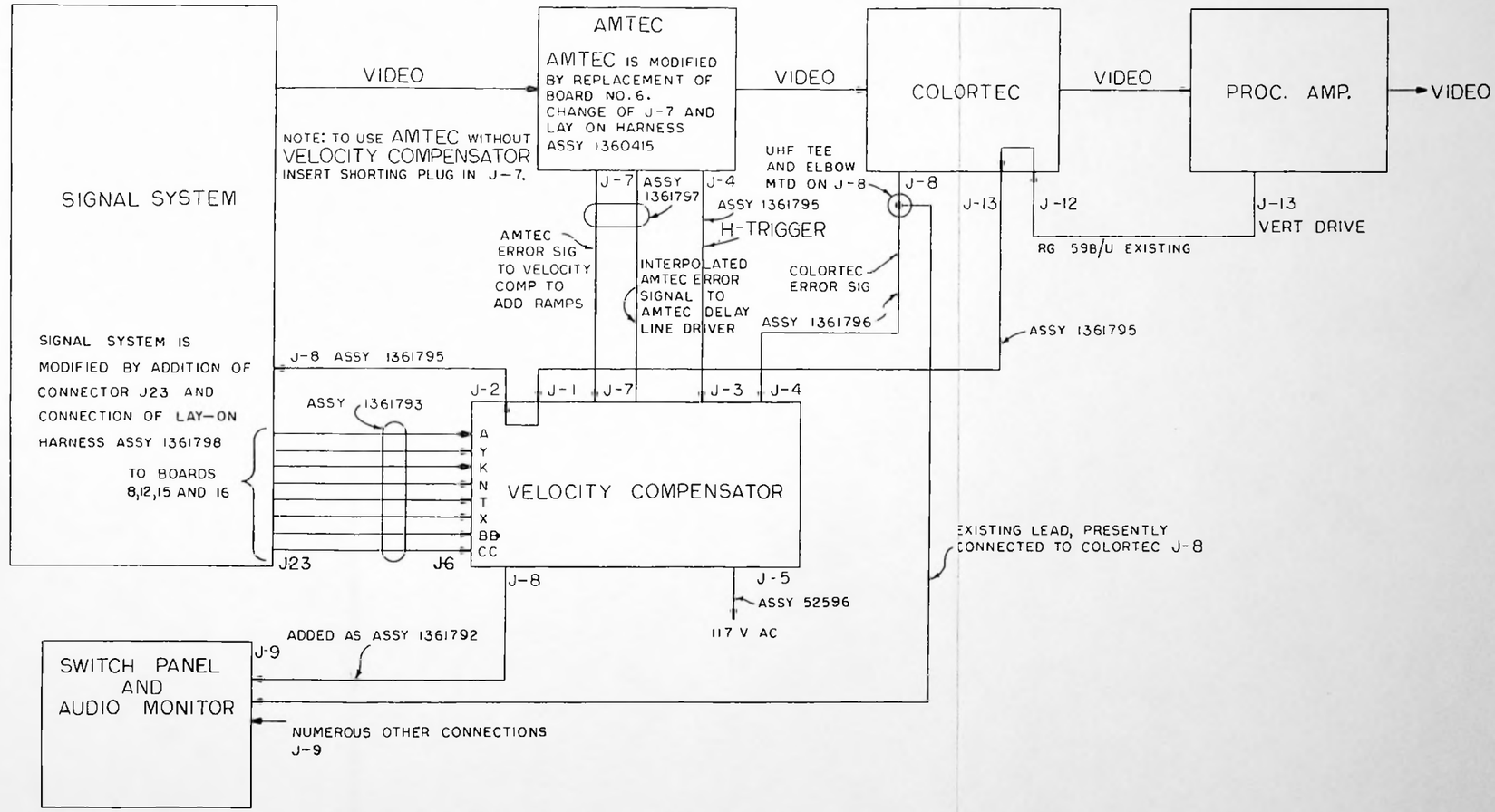
When a symbol is shown as part of a circuit, the small circles on the input/output lines have no digital-logic significance, but are shown solely as pin-location symbols.

Table 6.1-1. Logic Functions of Integrated Components

COMPONENT	FUNCTIONS	TRUTH TABLE
Buffer, Fairchild U5B990029	Positive Logic: $B = \overline{A}$ Negative Logic: $B = \overline{A}$ A = PIN 3 B = PIN 5	
Dual Two-Input Gate Fairchild U5B991529	Positive Logic: $D = \overline{A+B+C} = \overline{A}\,\overline{B}\,\overline{C}$ $H = \overline{E+F+G} = \overline{E}\,\overline{F}\,\overline{G}$ Negative Logic: $D = \overline{A\,B\,C} = \overline{A}+\overline{B}+\overline{C}$ $H = \overline{E\,F\,G} = \overline{E}\,\overline{F}\,\overline{G}$ A = PIN 1 B = PIN 2 C = PIN 3 D = PIN 4 E = PIN 6 F = PIN 7 G = PIN 8 H = PIN 9	A B C | D H H H | L H H L | L H L H | L H L L | L L H H | L L H L | L L L H | L L L L | H
Dual Three-Input Gate Fairchild U5F991429	Positive Logic: $F = \overline{A+B} = \overline{A}\,\overline{B}$ $E = \overline{C+D} = \overline{C}\,\overline{D}$ Negative Logic: $F = \overline{A\,B} = \overline{A}+\overline{B}$ $E = \overline{C\,D} = \overline{C}+\overline{D}$	A B | F H H | L H L | L L H | L L L | H
J K Flip-Flop Fairchild U5F992629	Set Pin (2) t = n | Clear (4) | Output (9) t = n + 1 H | H | X^n H | L | H L | H | L L | L | $\overline{X^n}$ H = High L = Low X is the output state at time n	
Dual Inverter Fairchild U5F9927	Positive and Negative Logic: $H = \overline{A}$ $G = \overline{B}$ $F = \overline{C}$ $E = \overline{D}$ A = PIN 1 B = PIN 2 C = PIN 3 D = PIN 4 E = PIN 6 F = PIN 7 G = PIN 8 H = PIN 9	

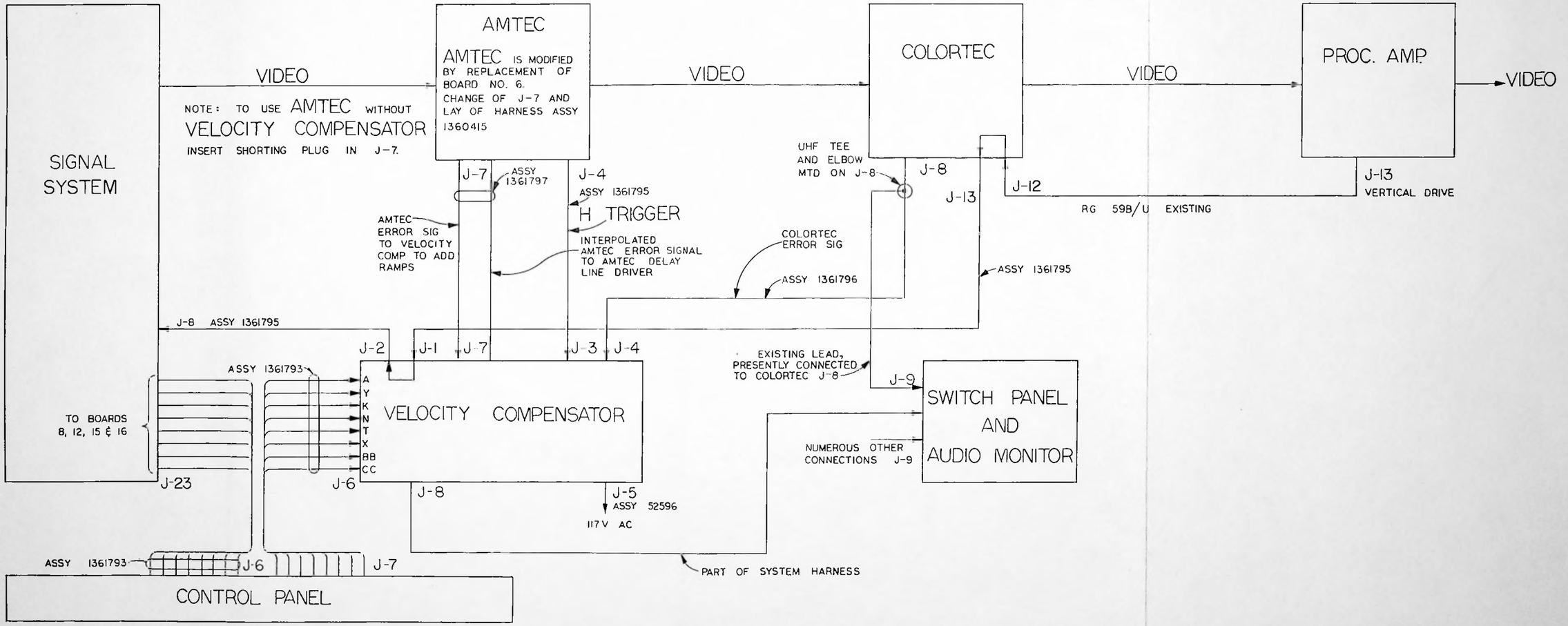
ALPHABETICAL INDEX TO SCHEMATICS

NUMERICAL INDEX TO SCHEMATICS



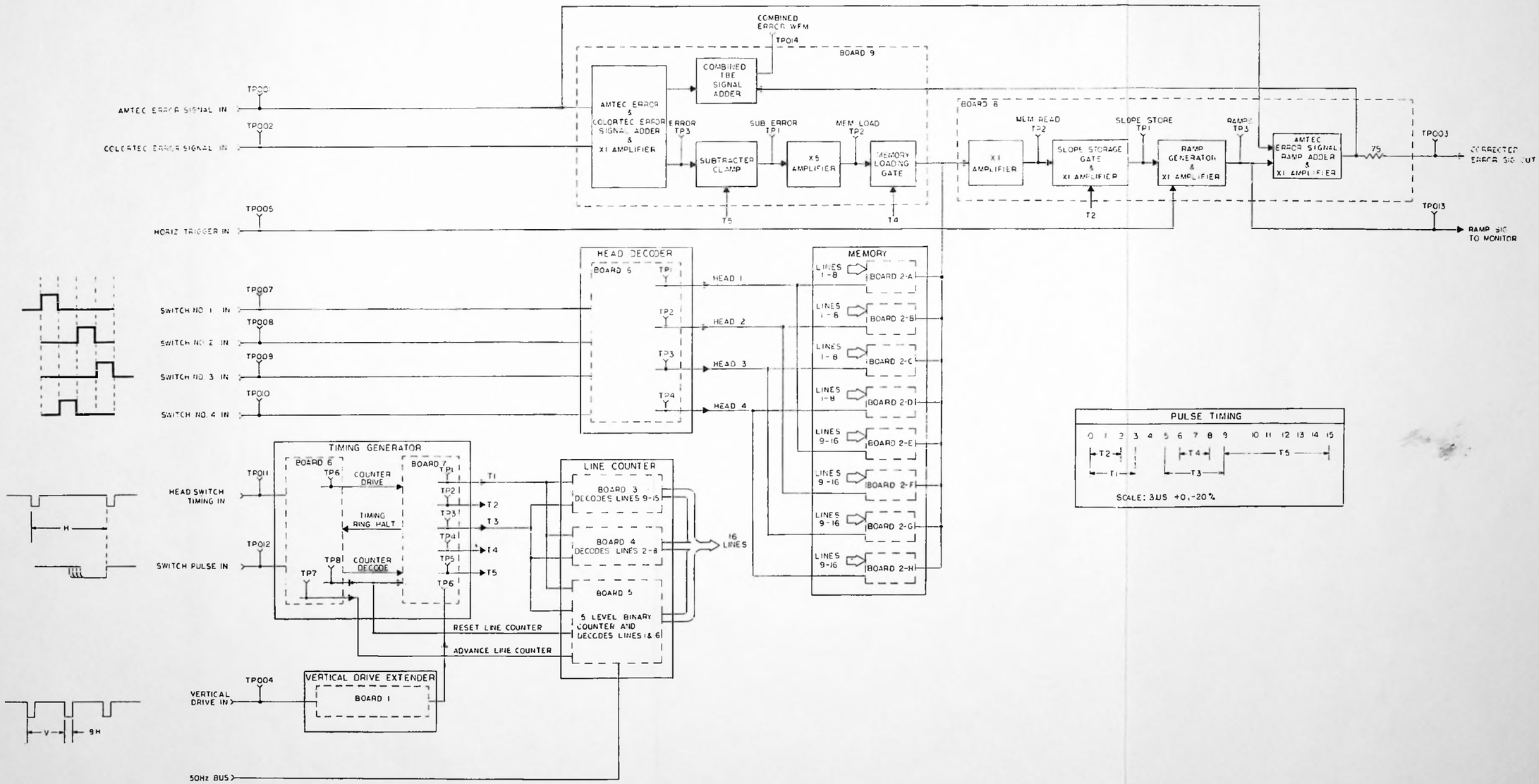
(Ref. Assy. 1805184)

Velocity Compensator (VR-1200) Interconnection Diagram
Dwg. No. 1385286



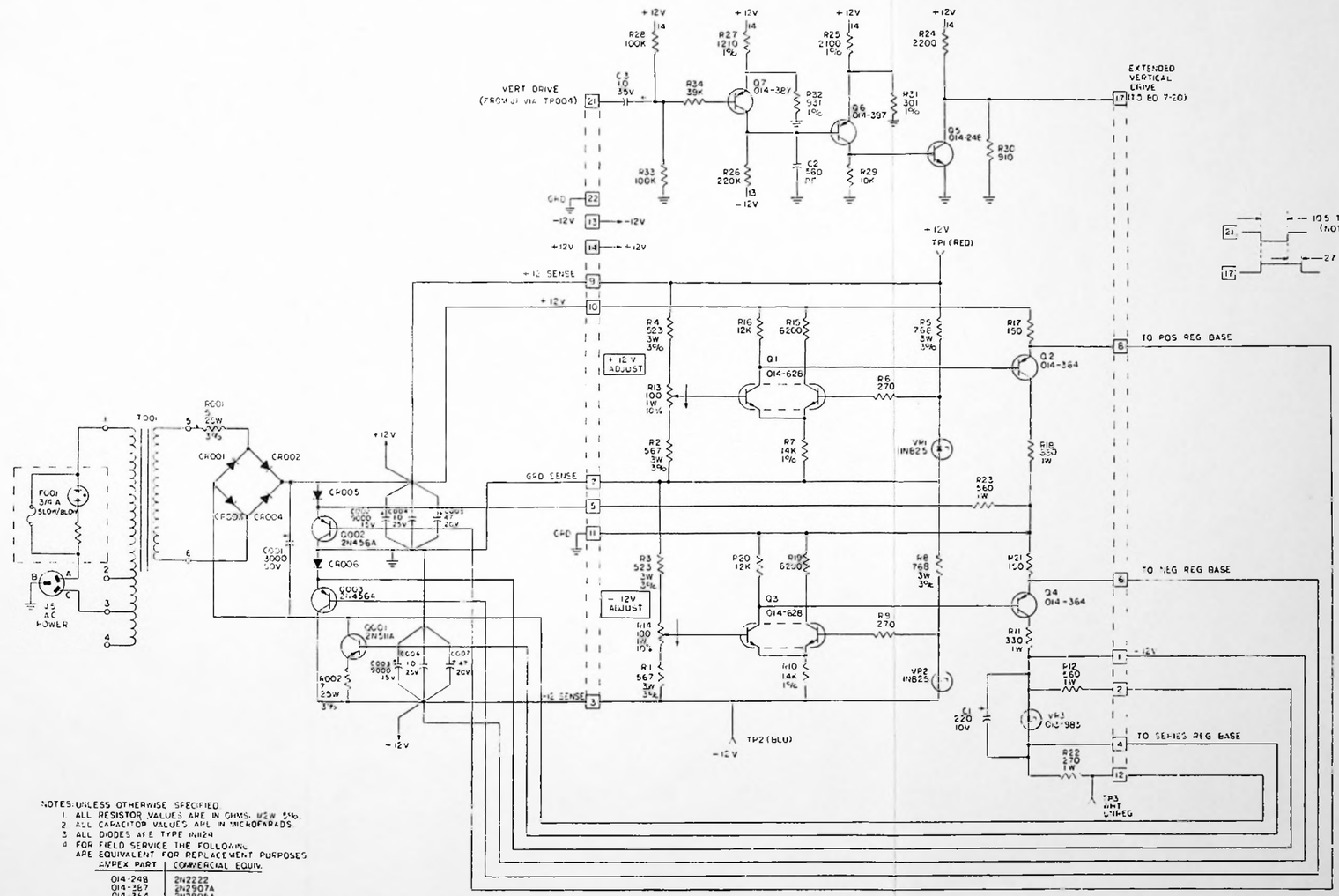
(Ref. Assy. 1805184)

Velocity Compensator (VR-1200A, VR-1200B)
Interconnection Diagram
Dwg. No. 1385549



(Ref. Assy. 1800778)

Velocity Compensator Block Diagram
Dwg. No. 1363644



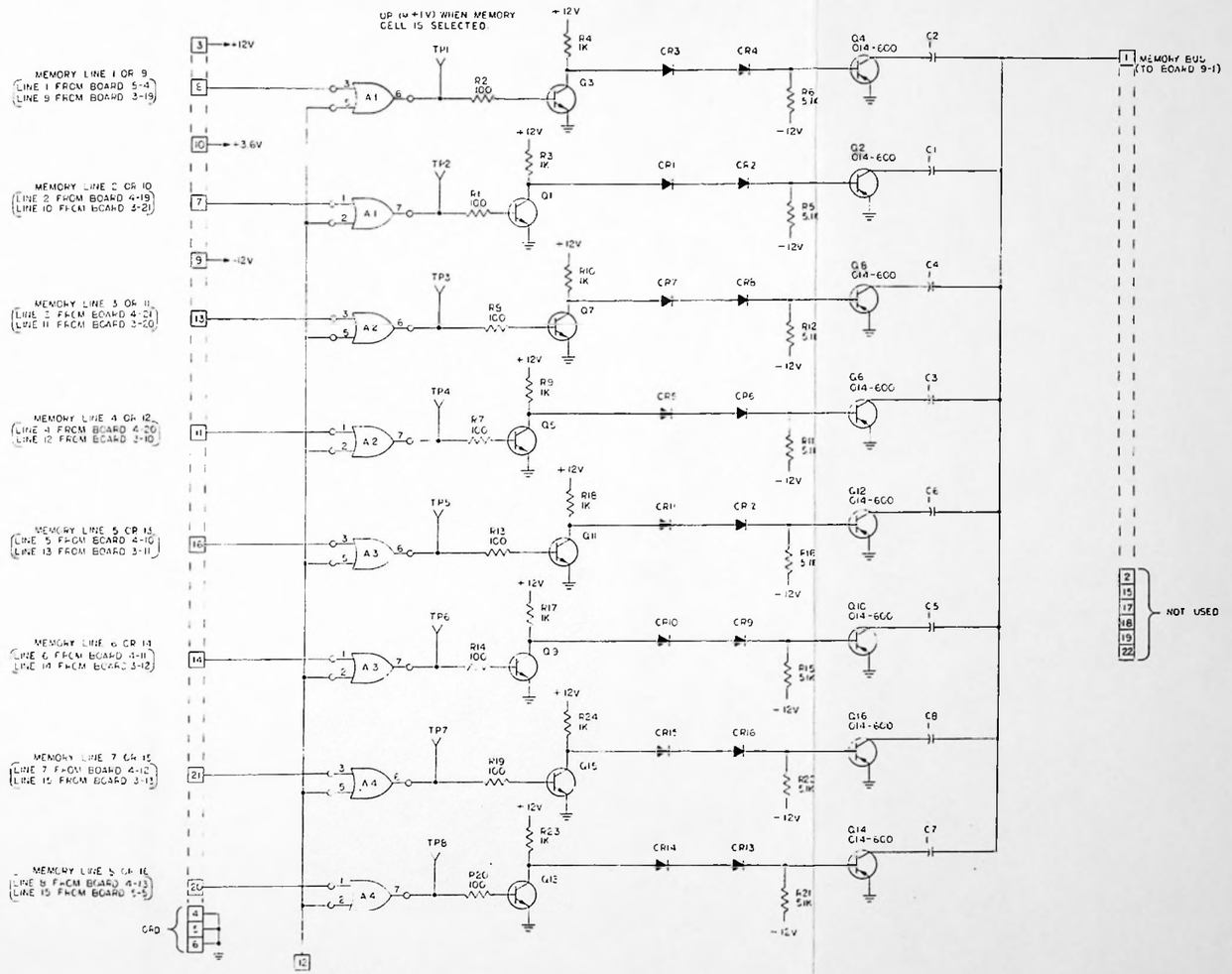
NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTOR VALUES ARE IN OHMS, WATTS 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL DIODES ARE TYPE IN124.
4. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES

AMPEX PART	COMMERCIAL EQUIV.
014-248	2N2222
014-387	2N2907A
014-364	2N2905A
014-625	2N2915
013-983	IN752A

LAST REF DES USED	NOT USED
C003	NONE
Q003	Q7
R002	R34
CR006	TP3
	VR3

Power Supply and Vertical Drive Board No. 1
Schematic
Dwg. No. 1242952

(Ref. Assy 1242950)



NOTES UNLESS OTHERWISE SPECIFIED

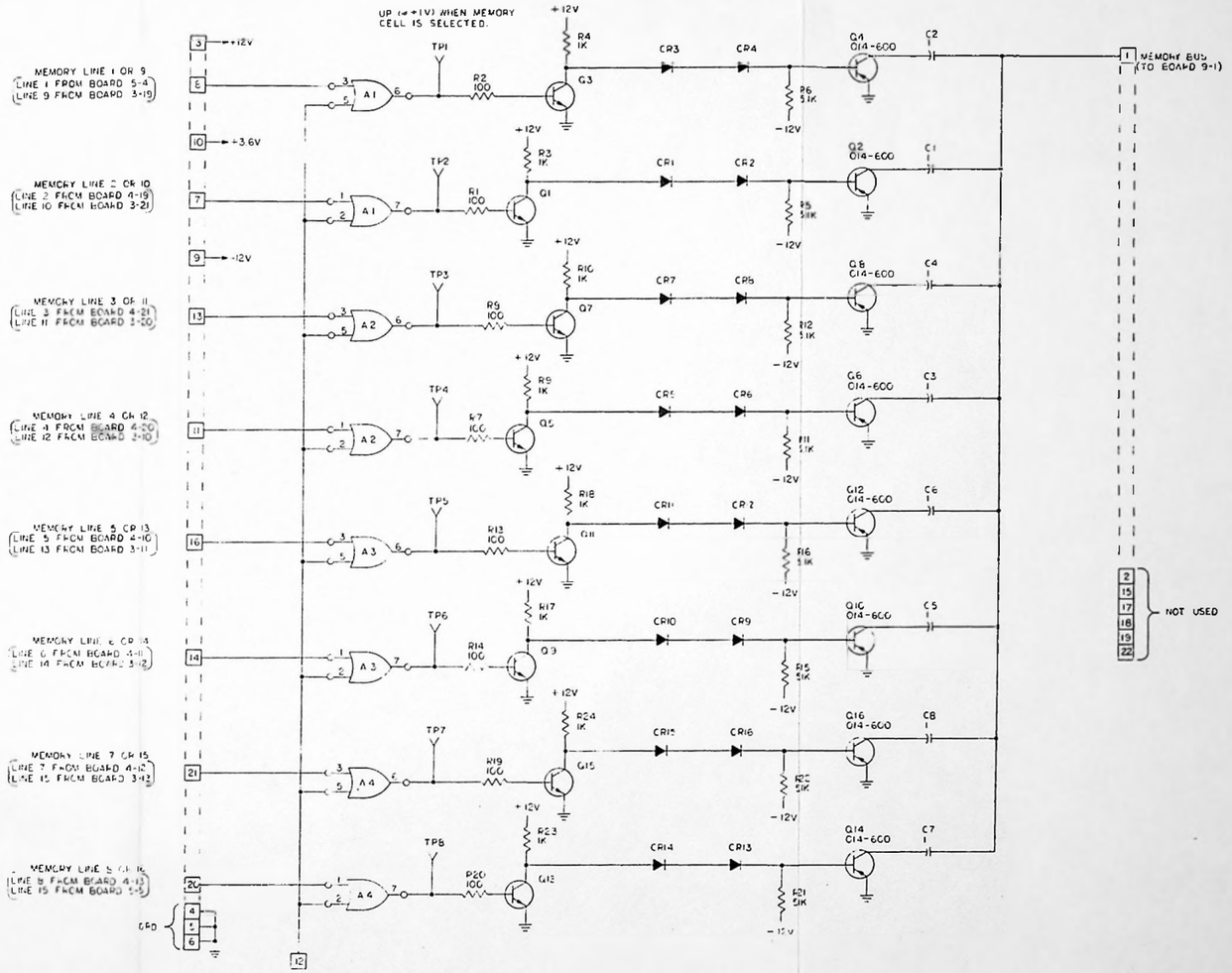
1. ALL RESISTOR VALUES ARE IN OHMS, ½W ±5%
2. ALL CAPACITOR VALUES ARE IN MICROFARADS
3. ALL TRANSISTORS ARE TYPE Q14-246
4. ALL DIODES ARE TYPE Q13-599
5. AMPEX PART Q14-600 IS A BILATERAL PNP TRANSISTOR WITH FORWARD & INVERTED BETA OF 15 AT 10 MA Ic
6. ALL LOGIC GATES ARE FAIRCHILD PART U5B991429
7. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES

AMPEX PART	COMMERCIAL EQUIV
Q13-599	IN456A
Q14-246	2N2222

LAST REF DES USED	NOT USED
R24	
Q16	
CR16	
C16	
A4	
TP8	

(Ref. Assy 1242953)

Memory Board No. 2 Schematic
Dwg. No. 1242955



NOTES UNLESS OTHERWISE SPECIFIED

1. ALL RESISTOR VALUES ARE IN OHMS, 1/2 W, 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS
3. ALL TRANSISTORS ARE TYPE 014-246
4. ALL DIODES ARE TYPE 013-599
5. AMPEX PART 014-600 IS A BILATERAL PNP TRANSISTOR WITH FORWARD & INVERTED h_{FE} OF 15 AT 10 MA I_C
6. ALL LOGIC GATES ARE FAIRCHILD PART U5B991429
7. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES

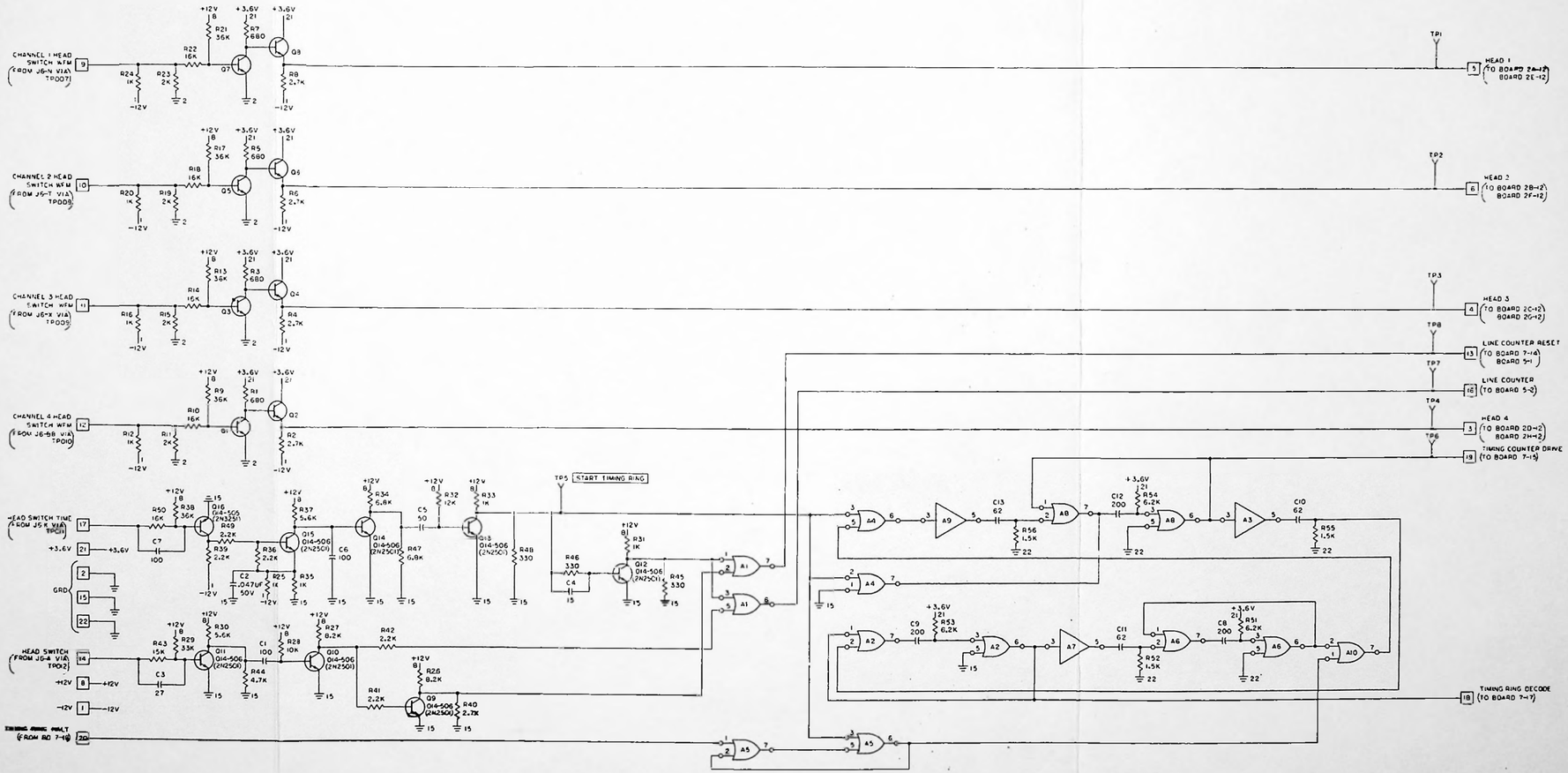
AMPEX PART	COMMERCIAL EQUIV.
013-599	IN456A
014-246	2N2222

LAST REF DES USED | NOT USED

R24
CR16
Q16
A4
TP8

(Ref. Assy 1242953)

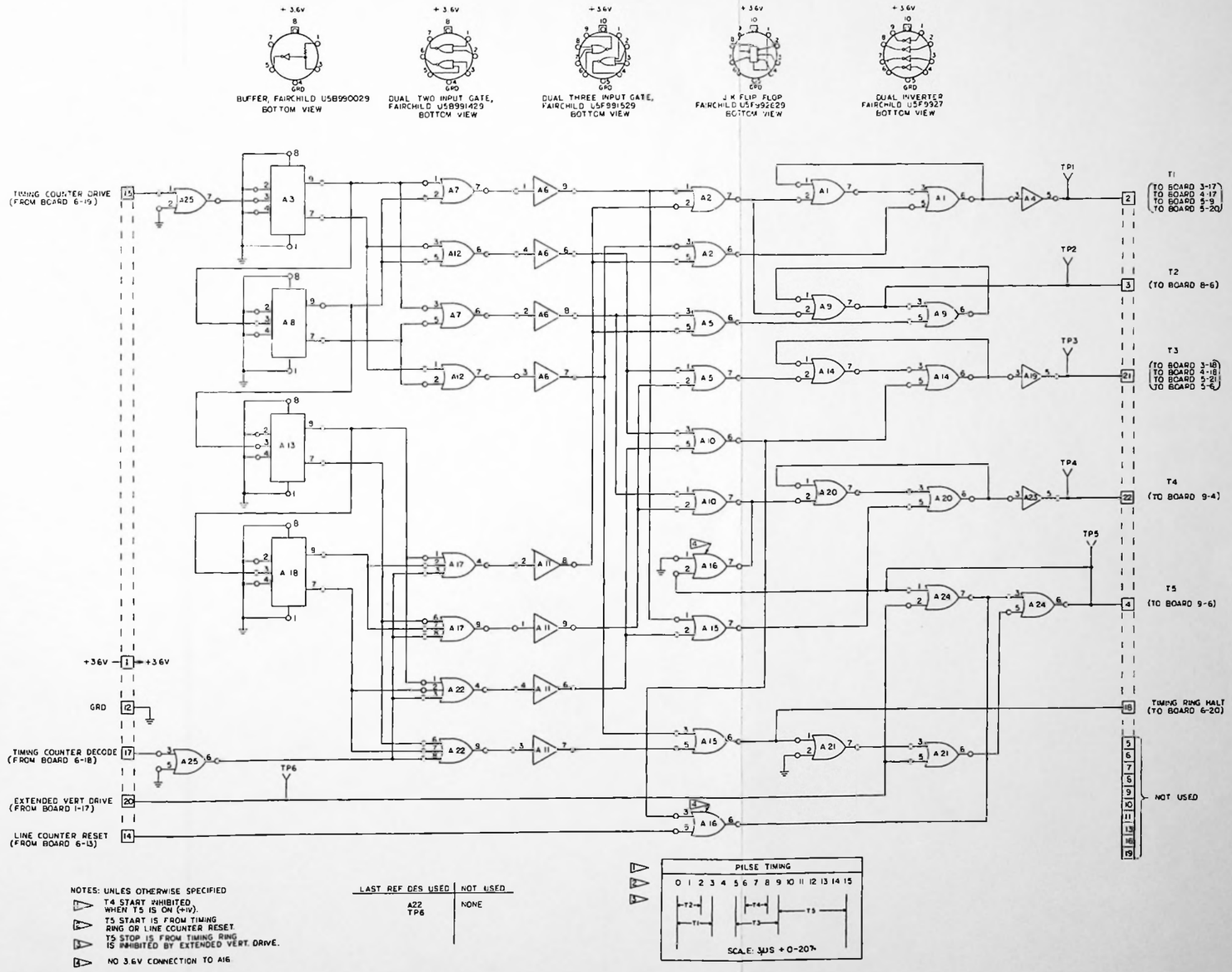
Memory Board No. 2 Schematic
Dwg. No. 1242955



NOTES: UNLESS OTHERWISE SPECIFIED.
1. ALL RESISTOR VALUES ARE IN OHMS, 1/2W, 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS, 500V.
3. ALL TRANSISTORS ARE AMPEX PART CM-248 (2N2222).

(Ref. Assy 1242965)

Head Decoder Board No. 6 Schematic
Dwg. No. 1385255



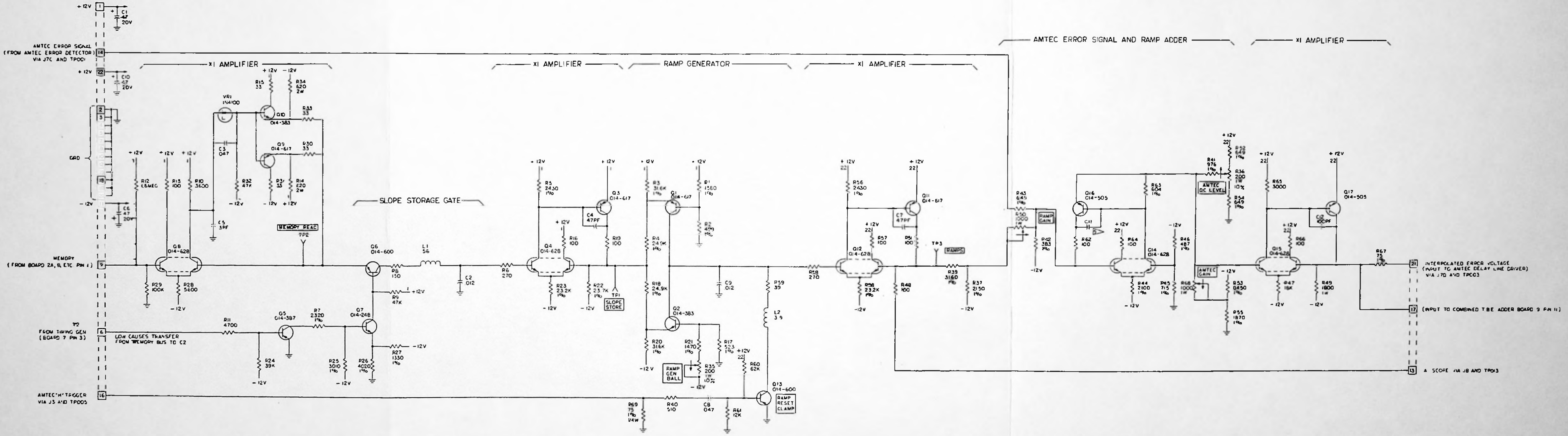
NOTES: UNLES OTHERWISE SPECIFIED

1. T4 START INHIBITED WHEN T5 IS ON (+1V).
2. T5 START IS FROM TIMING RING OR LINE COUNTER RESET.
3. T5 STOP IS FROM TIMING RING IS INHIBITED BY EXTENDED VERT. DRIVE.
4. NO 3.6V CONNECTION TO A16

LAST REF DES USED	NOT USED
A22 TP6	NONE

(Ref. Assy 1242968)

Timing Generator Board No. 7 Schematic
Dwg. No. 1242970



NOTES UNLESS OTHERWISE SPECIFIED

1. ALL CAPACITOR VALUES ARE IN MICROFARADS
2. ALL RESISTOR VALUES ARE IN OHMS, 1/2W 5%
3. ALL INDUCTOR VALUES ARE IN MICROHENRIES
4. AMPEX PART 014-600 IS A BILATERAL PNP TRANSISTOR WITH FORWARD & INVERTED h_{FE} OF 15 AT 10ma I_C
5. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES

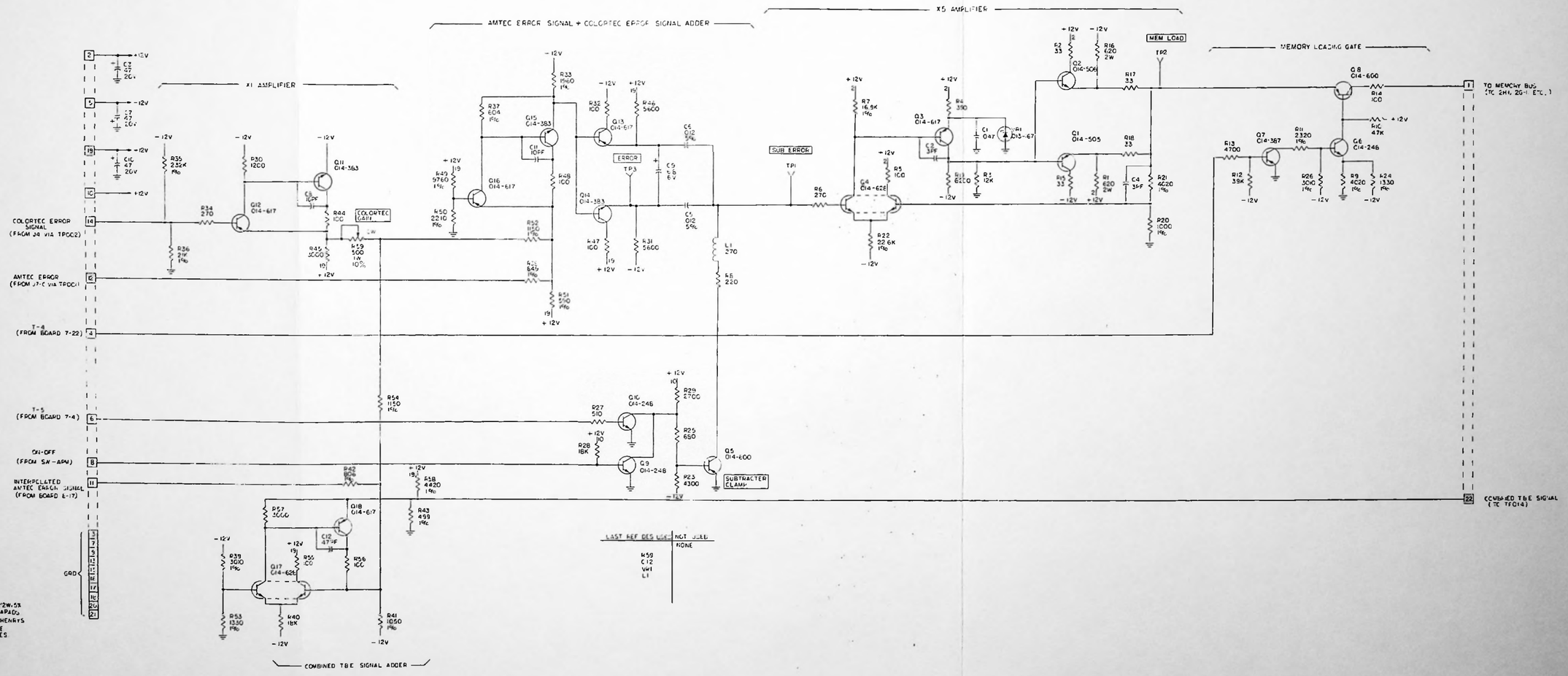
AMPEX PART	COMMERCIAL EQUIV.
014-248	2N2222
014-383	2N2484
014-387	2N2907A
014-505	2N3251
014-617	2N2605
014-628	2N2915

▷ SELECTED UPON FACTORY CALIBRATION.

LAST REF DES USED	NOT USED
C12	NONE
VR1	
Q16	
R69	
TP3	

(Ref. Assy 1242971)

Read Processing Board No. 8 Schematic
Dwg. No. 1242973A



NOTES UNLESS OTHERWISE SPECIFIED

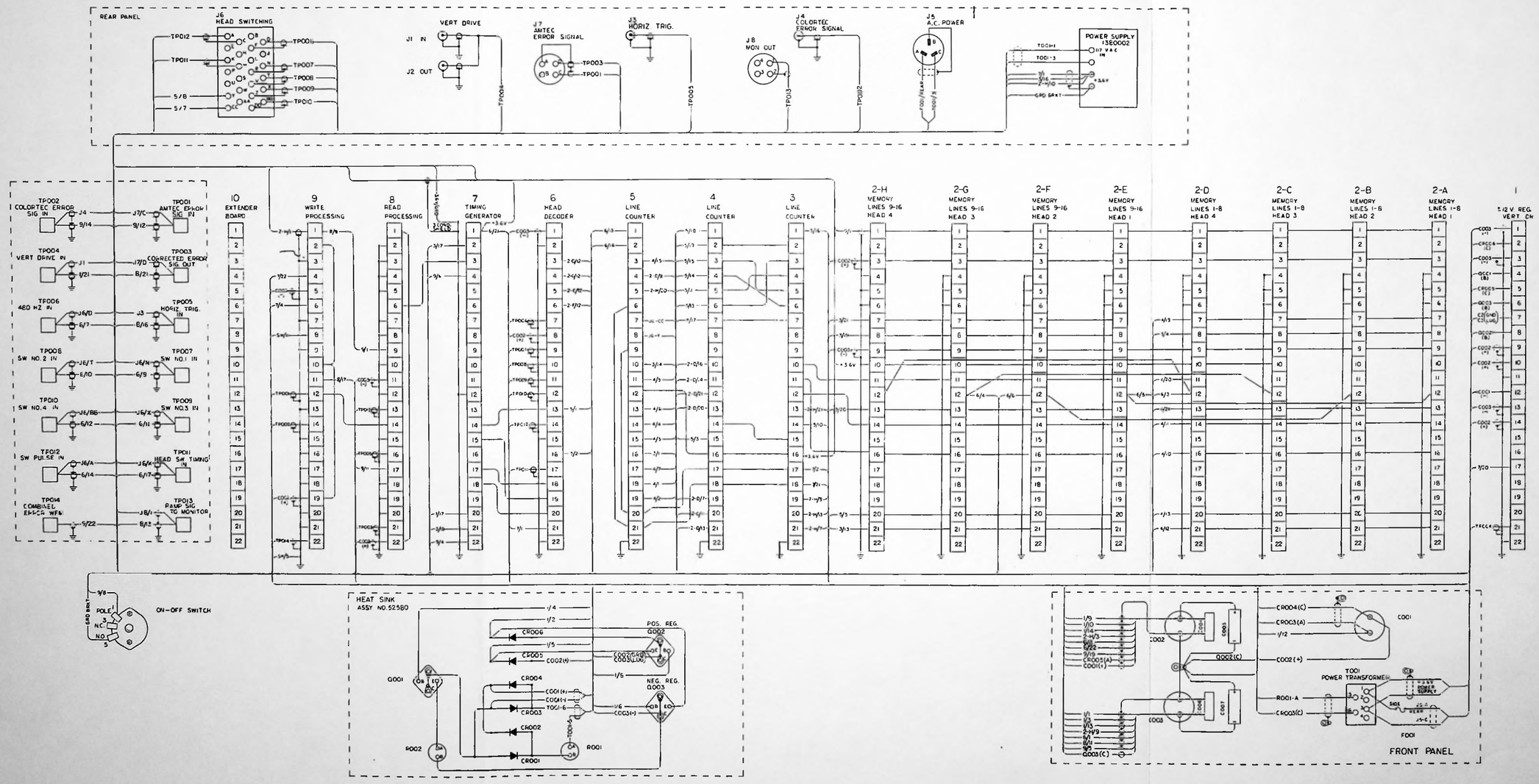
1. ALL RESISTOR VALUES ARE IN OHMS 1/2W 5%
2. ALL CAPACITOR VALUES ARE IN MICROFARADS
3. ALL INDUCTANCE VALUES ARE IN MICROHENRYS
4. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES

AMPEX PART	COMMERCIAL EQUIV.
C13-167	MI7514
C14-248	2N5222
C14-383	2N2484
C14-387	2N2907A
C14-505	2N3251
C14-506	2N2564
C14-617	2N2605
C14-626	2N2915

5 AMPEX PART C14-666 IS A BILATERAL PNP TRANSISTOR WITH FORWARD & INVERTED hFE OF 15 AT 10 MA IC

(Ref. Assy 1242974)

Write Processing (Board 9) Schematic
Dwg. No. 1242976A

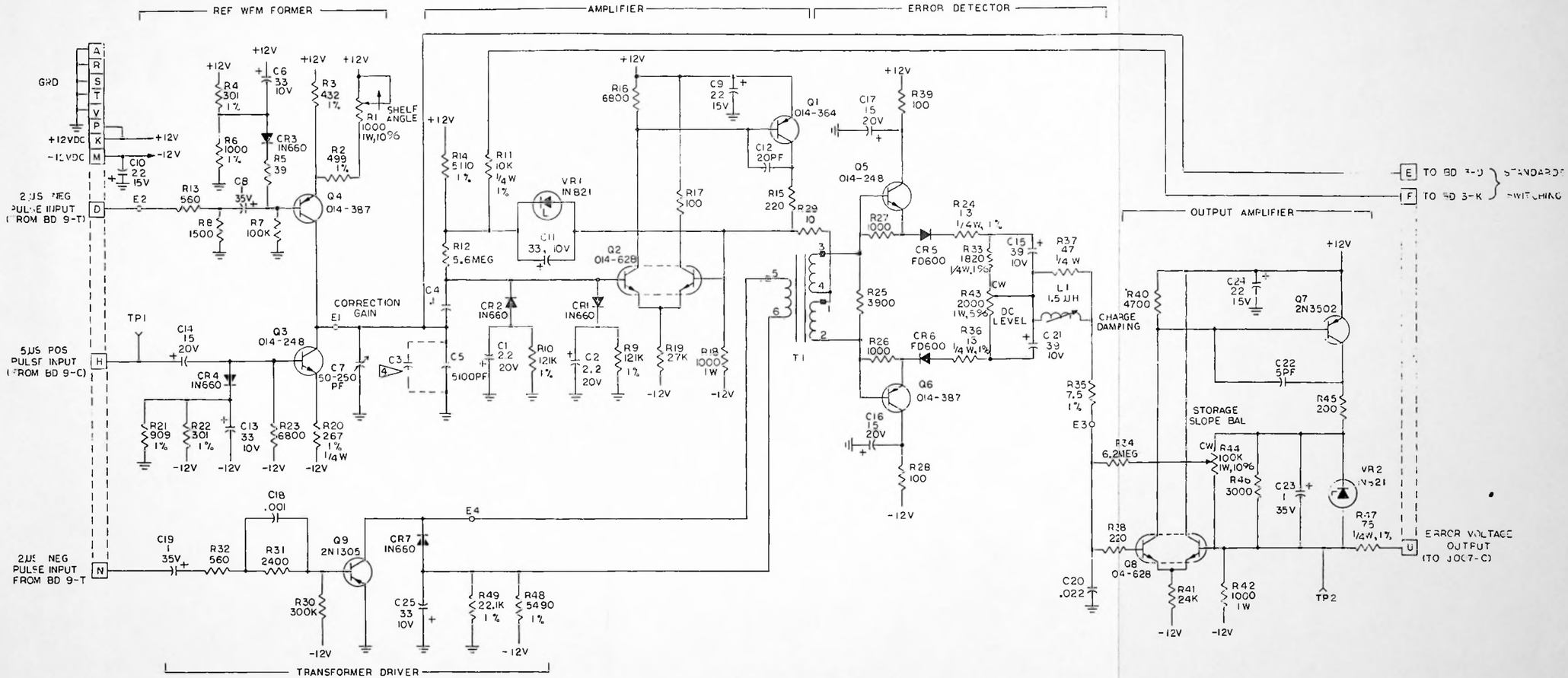


DESTINATION CODE
TWO NC = DEST SYM / MIN NO
ONE NC = DEST SYM

(Ref. Assy. 1360013)

Velocity Compensator Wiring Diagram
Dwg. No. 1385260

6.1-21/22



NOTES:
UNLESS OTHERWISE SPECIFIED;
1. ALL RESISTOR VALUES ARE IN OHMS, 1/2W, 5%.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. FOR FIELD SERVICE THE FOLLOWING ARE EQUIVALENT FOR REPLACEMENT PURPOSES:

AMPEX PART	COMMERCIAL EQUIV
014-248	2N 2222
014-364	2N 2905A
014-387	2N 2907A
014-628	2N 2915

4 THIS CAPACITOR IS SELECTED TO PLACE C7 WITHIN THE RANGE REQUIRED FOR CORRECTION GAIN ADJUSTMENT IN THE PARTICULAR AMTEC UNIT INVOLVED. C3 VALUE WILL BE WITHIN THE RANGE OF 0 PF TO 1000 PF.

LAST REF DES USED	REF DES NOT USED
C25	NONE
CR7	
E4	
L1	
Q9	
R49	
TP2	
VR2	

(Ref. Assy. 1360008)

Amtec Error Detector (Board No. 6) Schematic
Dwg. No. 1385002B

ALPHABETICAL INDEX TO ASSEMBLIES

ALPHABETICAL INDEX TO ASSEMBLIES (Continued)

NUMERICAL INDEX TO ASSEMBLIES

VELOCITY COMPENSATOR KIT

CATALOG NO. 1805140

SHEET 1 OF 1

NHA

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -06	-07	-08
5	1800778-02			VELOCITY COMPENSATOR, Final Assembly		1	1	1
9	1805184-05			VELOCITY COMPENSATOR INSTALLATION KIT		1	-	-
10	1805184-06			VELOCITY COMPENSATOR INSTALLATION KIT		-	1	-
11	1809990			MANUAL		2	2	-
12	1805184-07			VELOCITY COMPENSATOR INSTALLATION KIT		-	-	1

USAGE DATA

VERSION	USED WITH
-06	VR-1200
-07	VR-1200B (SIDE MONITOR)
-08	VR-1200A (TOP MONITOR)

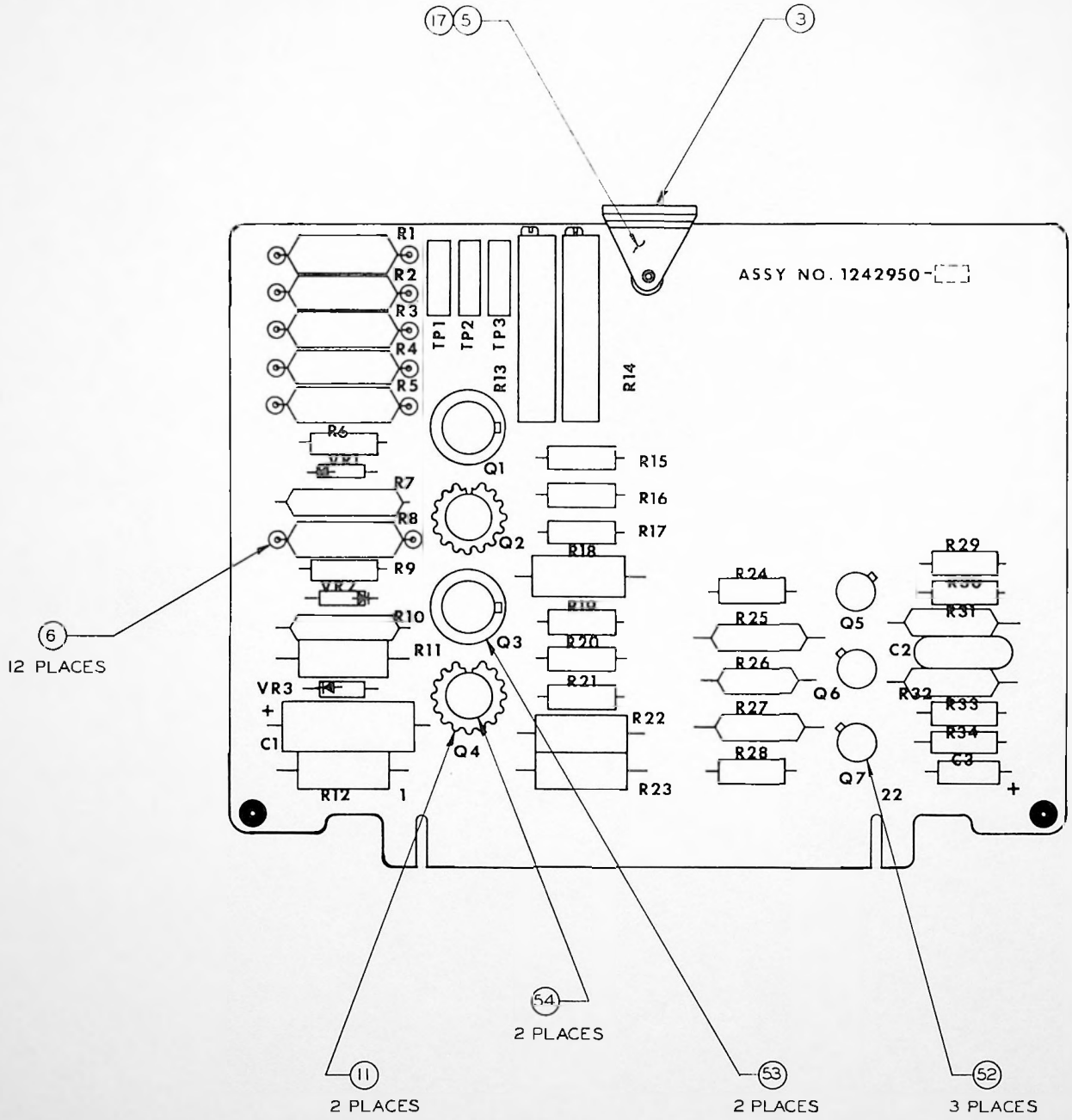
VELOCITY COMPENSATOR FINAL ASSEMBLY

CATALOG NO. 1800778

SHEET 1 OF 1

NHA 1805140

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02
1	1242950-01			PRINTED WIRING ASSEMBLY, ±12V Regulator, board 1		1
2	1242953-01			PRINTED WIRING ASSEMBLY, Memory, board 2		8
7	1242968-01			PRINTED WIRING ASSEMBLY, Timing Generator, board 7		1
8	1242971-01			PRINTED WIRING ASSEMBLY, Read Processing, board 8		1
9	1242974-01			PRINTED WIRING ASSEMBLY, Write Processing, board 9		1
10	1242977-01			PRINTED WIRING ASSEMBLY, Extender Board		1
12	6000022-10			LABEL, Identification		1
14	1242956-02			PRINTED WIRING ASSEMBLY, Line Counter, board 3		1
15	1242959-02			PRINTED WIRING ASSEMBLY, Line Counter, board 4		1
16	1361354-01			PRINTED WIRING ASSEMBLY, Line Counter, board 5		1
18	1360013-02			CHASSIS ASSEMBLY, Velocity Compensator		1
19	1363644			BLOCK DIAGRAM		REF



Regulator and Vertical Drive (±12V)
Board No. 1 Printed Wiring Assembly
Dwg. No. 1242950-01A

REGULATOR AND VERTICAL DRIVE (±12V) BOARD 1
PRINTED WIRING ASSEMBLY

CATALOG NO. 1242950

NHA 1800778

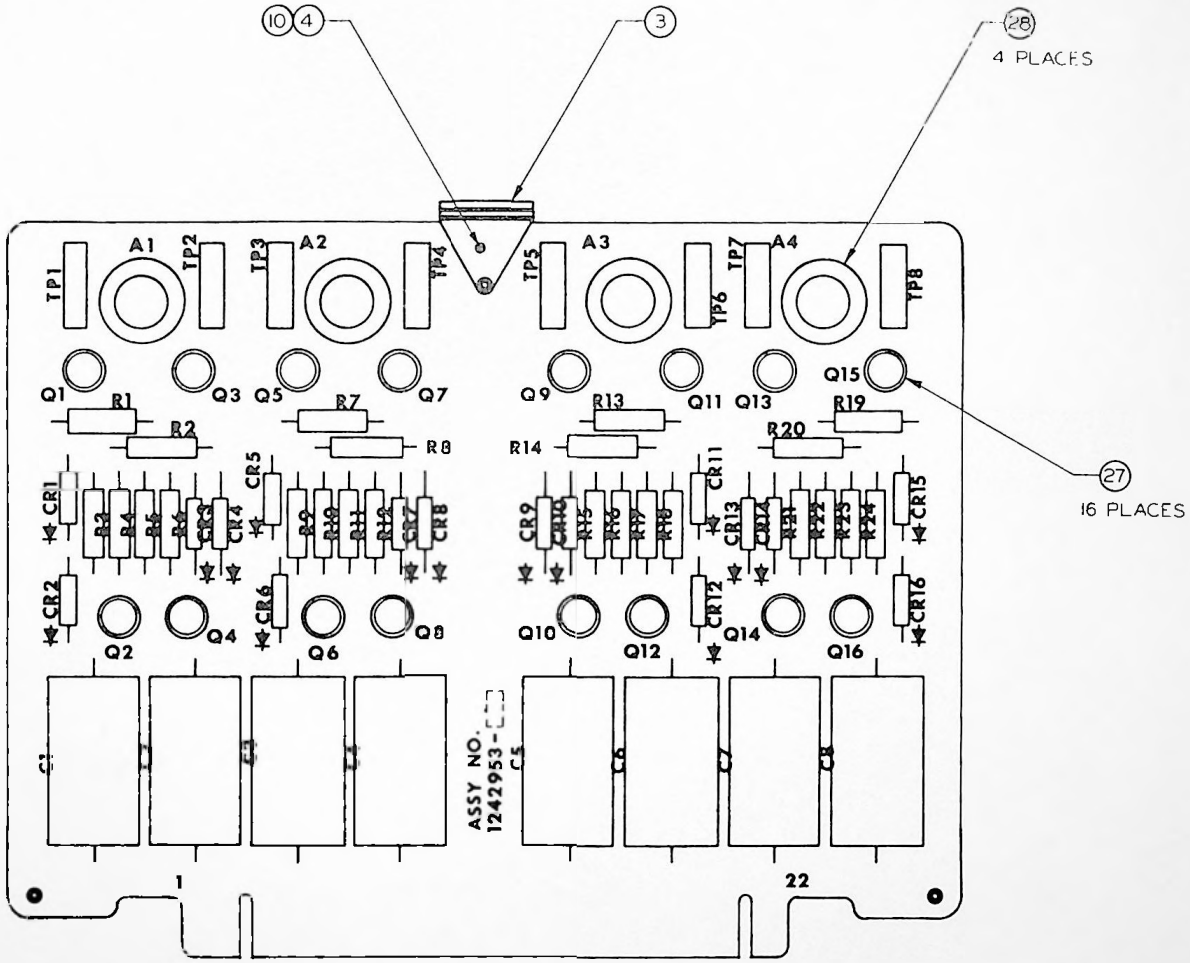
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
1	1242951-01			PRINTED WIRING BOARD		1
2			1242952	SCHEMATIC		REF
3	1242979-01			LABEL, Identification, board 1		1
5	52528-01			SNAP-ON HANDLE, Circuit Board		1
6	103307-01			STANDOFF		12
8	013-202	1N825	VR1,2	DIODE, Zener		2
9	013-983		VR3	DIODE, Zener, CD32		1
11	014-070			HEAT SINK, Red		2
12	014-364		Q2,4	TRANSISTOR, CD438		2
13	014-248		Q5	TRANSISTOR, CD37		1
14	014-387		Q6,7	TRANSISTOR, CD437		2
15	014-628		Q1,3	TRANSISTOR, CD534		2
19	034-363		C2	CAPACITOR, DM19 Silver Mica, 2000 pF, 1%		1
20	037-993		C1	CAPACITOR, Tantalum, 220 mfd, 10V, ±20%		1
21	037-058		C3	CAPACITOR, Tantalum, 1 mfd, 35V, ±20%		1
23	041-014		R29	RESISTOR, Composition, 10 K, 1/2W, ±5%		1
24	041-018		R34	RESISTOR, Composition, 39 K, 1/2W, ±5%		1
25	041-023		R28,33	RESISTOR, Composition, 100 K, 1/2W, ±5%		2
26	062-046		R26	RESISTOR, Metal Film, 226 K, 1/4W, ±1%		1
27	041-099		R22	RESISTOR, Composition, 270 ohms, 1W, ±5%		1
28	041-239		R24	RESISTOR, Composition, 2200 ohms, 1/2W, ±5%		1
29	041-273		R6,9	RESISTOR, Composition, 270 ohms, 1/2W, ±5%		2
30	041-282		R17,21	RESISTOR, Composition, 150 ohms, 1/2W, ±5%		2
31	041-420		R16,20	RESISTOR, Composition, 12 K, 1/2W, ±5%		2
32	041-455		R15,19	RESISTOR, Composition, 6200 ohms, 1/2W, ±5%		2
33	041-501		R11,18	RESISTOR, Composition, 330 ohms, 1W, ±5%		2
34	041-522		R30	RESISTOR, Composition, 910 ohms, 1/2W, ±5%		1
35	041-999		R12,23	RESISTOR, Composition, 560 ohms, 1W, ±5%		2

REGULATOR AND VERTICAL DRIVE (±12V) BOARD 1
PRINTED WIRING ASSEMBLY

CATALOG NO. 1242950

NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
37	044-804		R13, 14	RESISTOR, Variable, 100 ohms, 1W, ±10%		2
38	048-002		R7, 10	RESISTOR, Metal Film, 14 K, 1/2W, ±1%		2
39	048-131		R27	RESISTOR, Metal Film, 1210 ohms, 1/2W, ±1%		1
40	048-704		R31	RESISTOR, Metal Film, 301 ohms, 1/2W, ±1%		1
41	057-560		R32	RESISTOR, Metal Film, 931 ohms, 1/2W, ±1%		1
42	057-561		R25	RESISTOR, Metal Film, 2100 ohms, 1/2W, ±1%		1
44	047-789		R3, 4	RESISTOR, Wirewound, 523 ohms, 3W, ±3%		2
45	047-790		R1, 2	RESISTOR, Wirewound 567 ohms, 3W, ±3%		2
46	047-791		R5, 8	RESISTOR, Wirewound, 768 ohms, 3W, ±3%		2
48	148-027		TP1	TEST POINT, Red		1
49	148-028		TP3	TEST POINT, White		1
50	148-030		TP2	TEST POINT, Blue		1
52	280-130			SPACER, Transistor, TO-18		3
53	280-173			SPACER, Transistor, internal circuit, 8 pin		2
54	280-998			SPACER, Transistor, TO-5		2



Memory Board No. 2 Printed Wiring Assembly
Dwg. No. 1242953-01

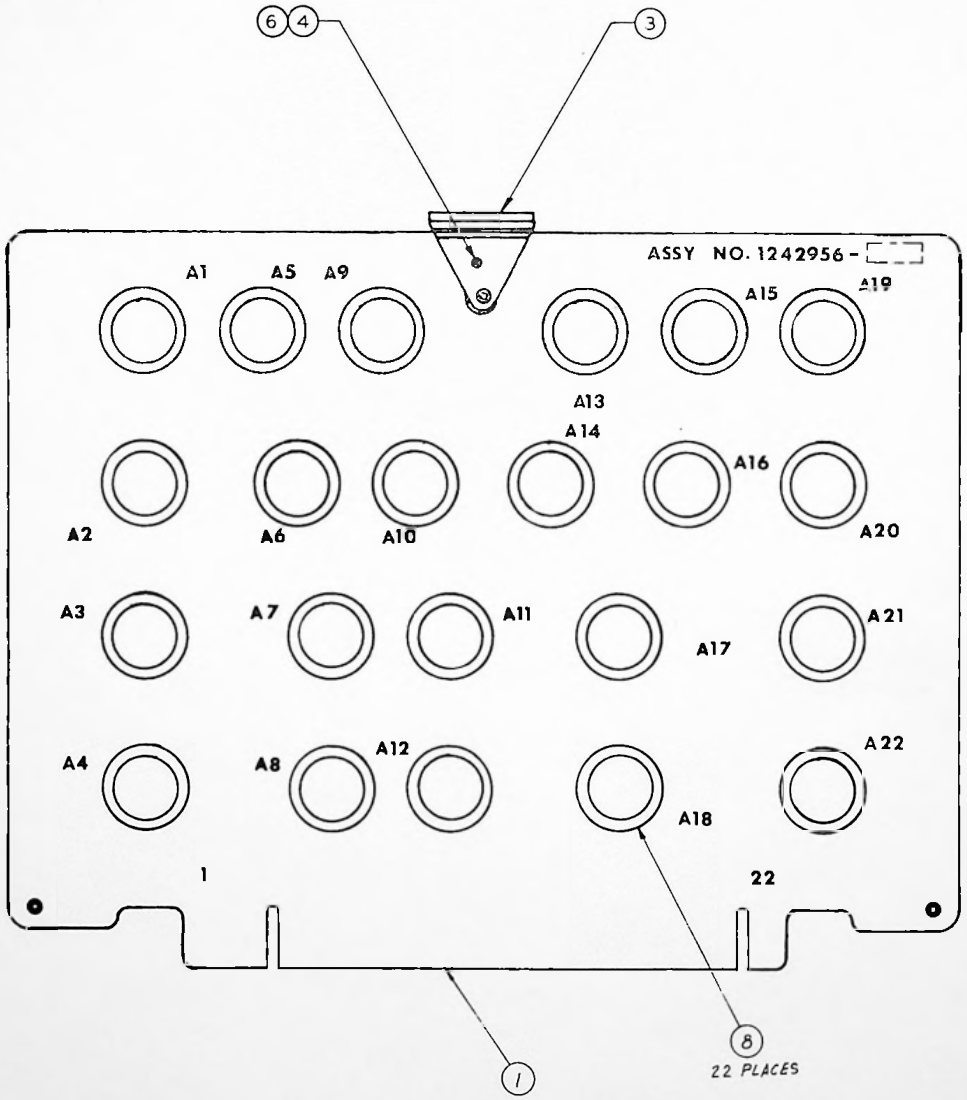
MEMORY BOARD 2 PRINTED WIRING ASSEMBLY

CATALOG NO. 1242953

SHEET 1 OF 1

NHA 1800778

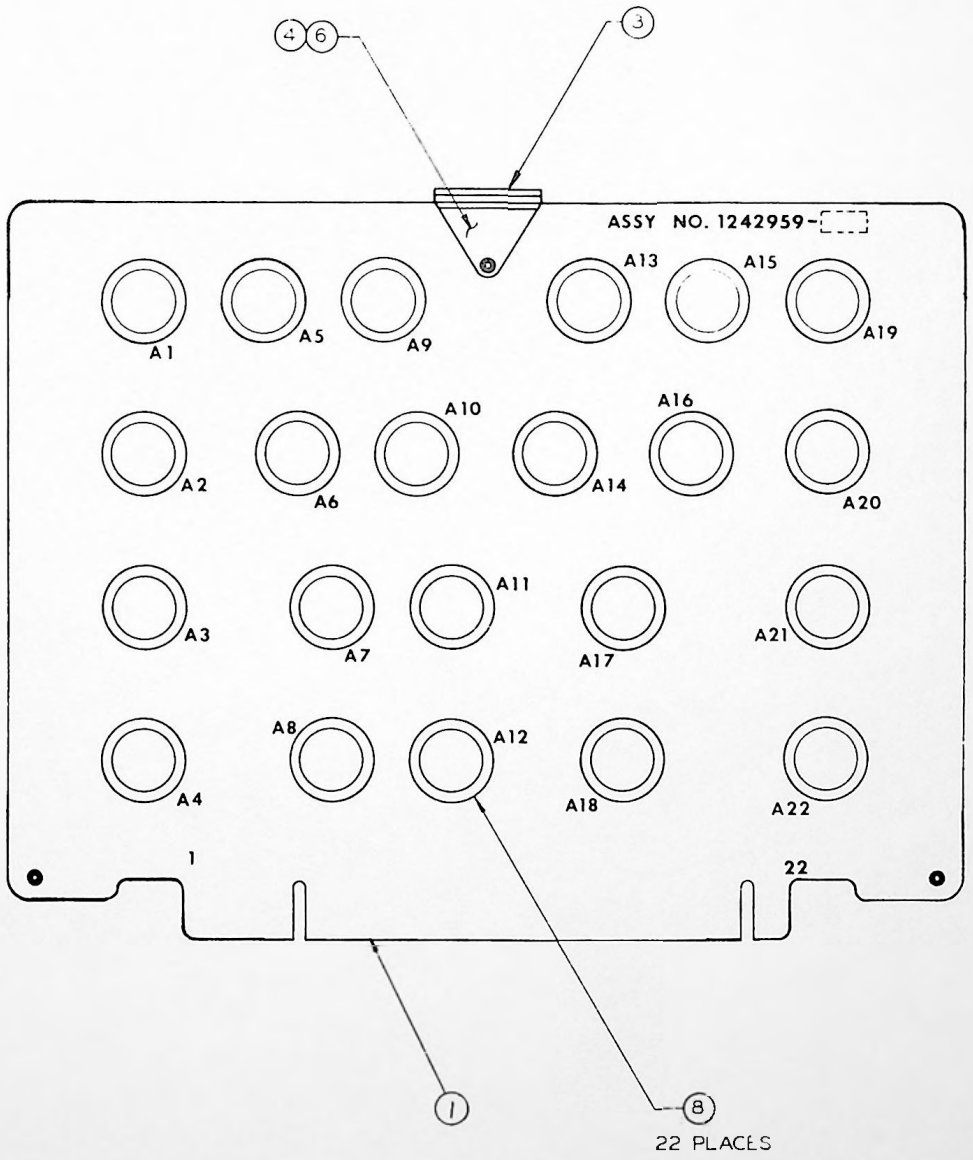
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2			1242955	SCHEMATIC		REF
3	1242979-02			LABEL, Identification, board no. 2		1
4	52528-01			HANDLE, Snap-on		1
6	013-599		CR1-16	DIODE, CD458		16
7	014-248		Q1, 3, 5, 7, 9, 11, 13, 15	TRANSISTOR, CD37		8
8	014-600		Q2, 4, 6, 8, 10, 12, 14, 16	TRANSISTOR, CD507		8
12	055-234		C1-8	CAPACITOR, Polycarbonate, 1.0 μF, 200V, ±10%		8
14	041-001		R5, 6, 11, 12, 15, 16, 21, 22	RESISTOR, Composition, 5.1K, 1/2W ±5%		8
15	041-003		R1, 2, 7, 8, 13, 19, 20	RESISTOR, Composition, 100 ohms, 1/2W, ±5%		8
16	041-245		R3, 4, 9, 10, 17, 18, 23, 24	RESISTOR, Composition, 1K, 1/2W, ±5%		8
18	148-027		TP2	CONNECTOR, Tip Jack, red		1
19	148-029		TP5	CONNECTOR, Tip Jack, green		1
20	148-030		TP6	CONNECTOR, Tip Jack, blue		1
21	148-031		TP4	CONNECTOR, Tip Jack, yellow		1
22	148-987		TP7	CONNECTOR, Tip Jack, purple		1
23	148-988		TP8	CONNECTOR, Tip Jack, grey		1
24	148-991		TP3	CONNECTOR, Tip Jack, orange		1
25	148-993		TP1	CONNECTOR, Tip Jack, brown		1
27	280-130			SPACER, Small, transistor		16
28	280-173			MOUNTING PAD, Integrated Circuit, 8 pin		4
30	586-021		A1-4	CIRCUIT, Integrated, dual-two input gate		4



Line Counter Board No. 3 Printed Wiring Assembly
Dwg. No. 1242956-02A

LINE COUNTER BOARD 3 PRINTED WIRING ASSEMBLY — CATALOG NO. 1242956 — SHEET 1 OF 1 — NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02
3	1242979-03			LABEL, Identification, board no. 3		1
4	52528-01			HANDLE, Snap-on		1
8	280-173			MOUNTING PAD, Integrated Circuit, 8 pin		22
10	586-021		A1-22	CIRCUIT, Integrated Logic, dual-two input gate		22
11			1385253	SCHEMATIC		REF



Line Counter Board No. 4 Printed Wiring Assembly
Dwg. No. 1242959-02A

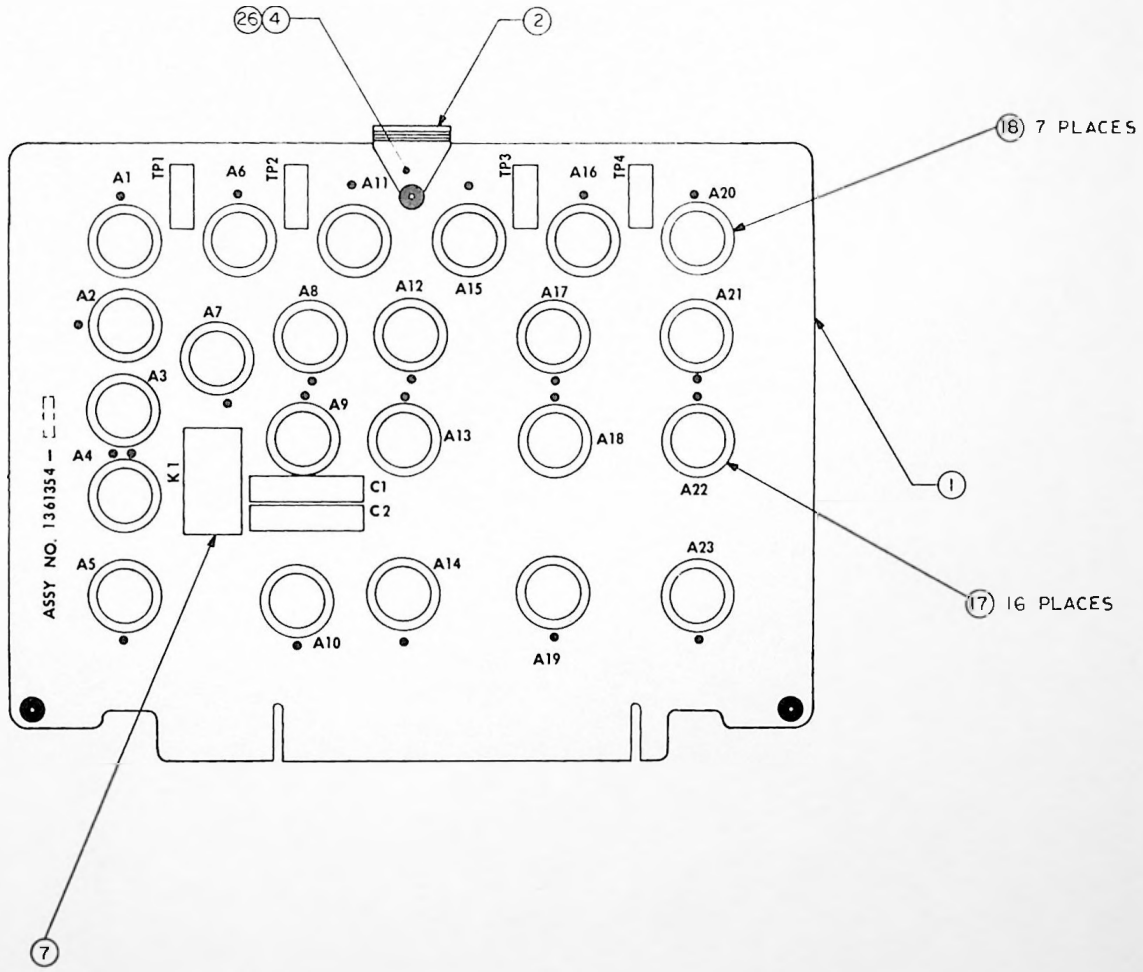
LINE COUNTER BOARD 4 PRINTED WIRING ASSEMBLY

CATALOG NO. 1242959

SHEET 1 OF 1

NHA 1800778

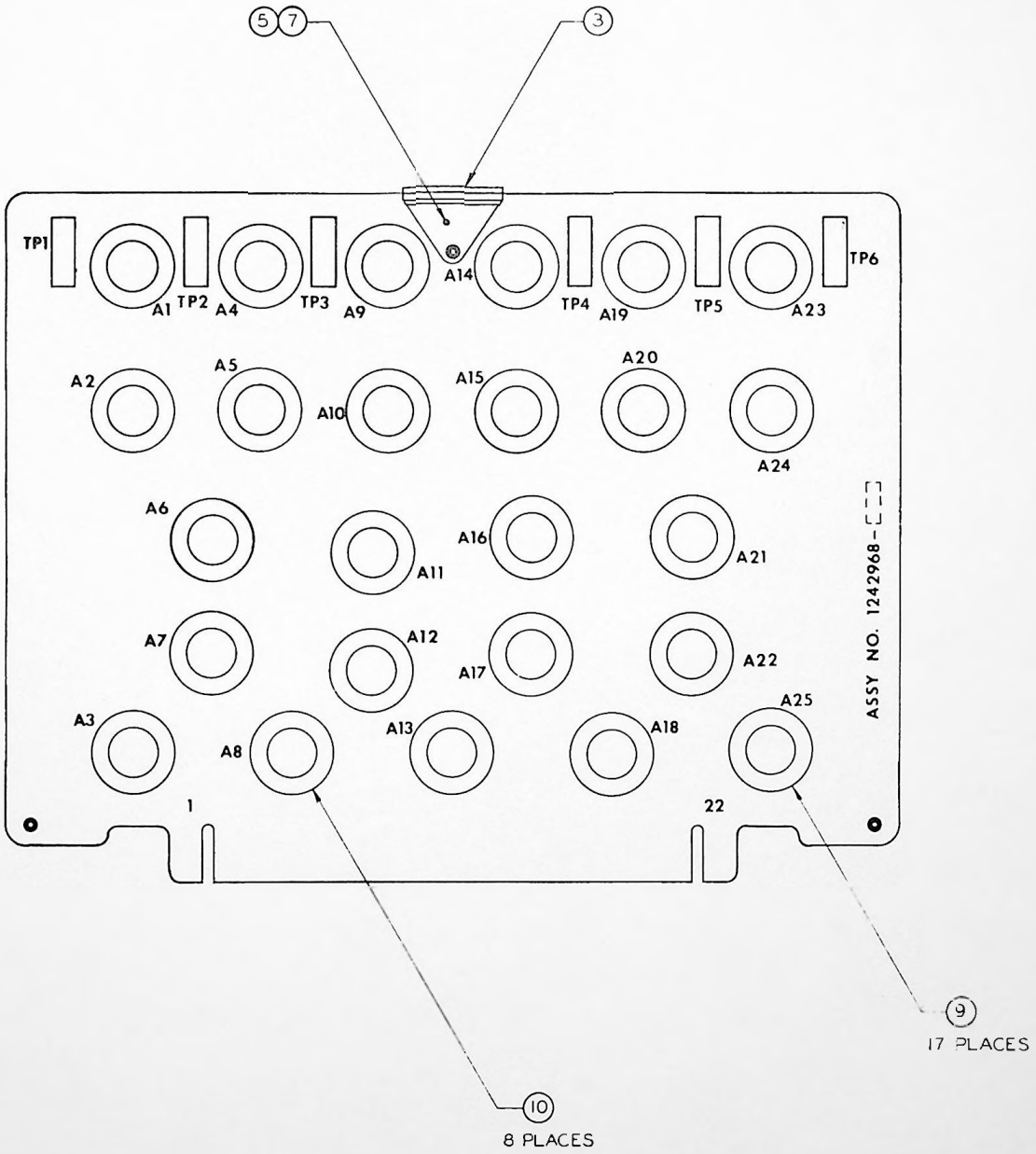
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02						
3	1242979-04			LABEL, Identification, board 4		1						
4	52528-01			HANDLE, Snap-on		1						
8	280-173			MOUNTING PAD, Integrated Circuit, 8 pin		22						
10	586-021		A1-22	CIRCUIT, Integrated Logic, dual-two input gate		22						
11			1385253	SCHEMATIC		REF						



Line Counter Board No. 5 Printed Wiring Assembly
Dwg. No. 1361354-01

LINE COUNTER BOARD 5 PRINTED WIRING ASSEMBLY	CATALOG NO. 1361354	SHEET 1 OF 1
		NHA 1800778

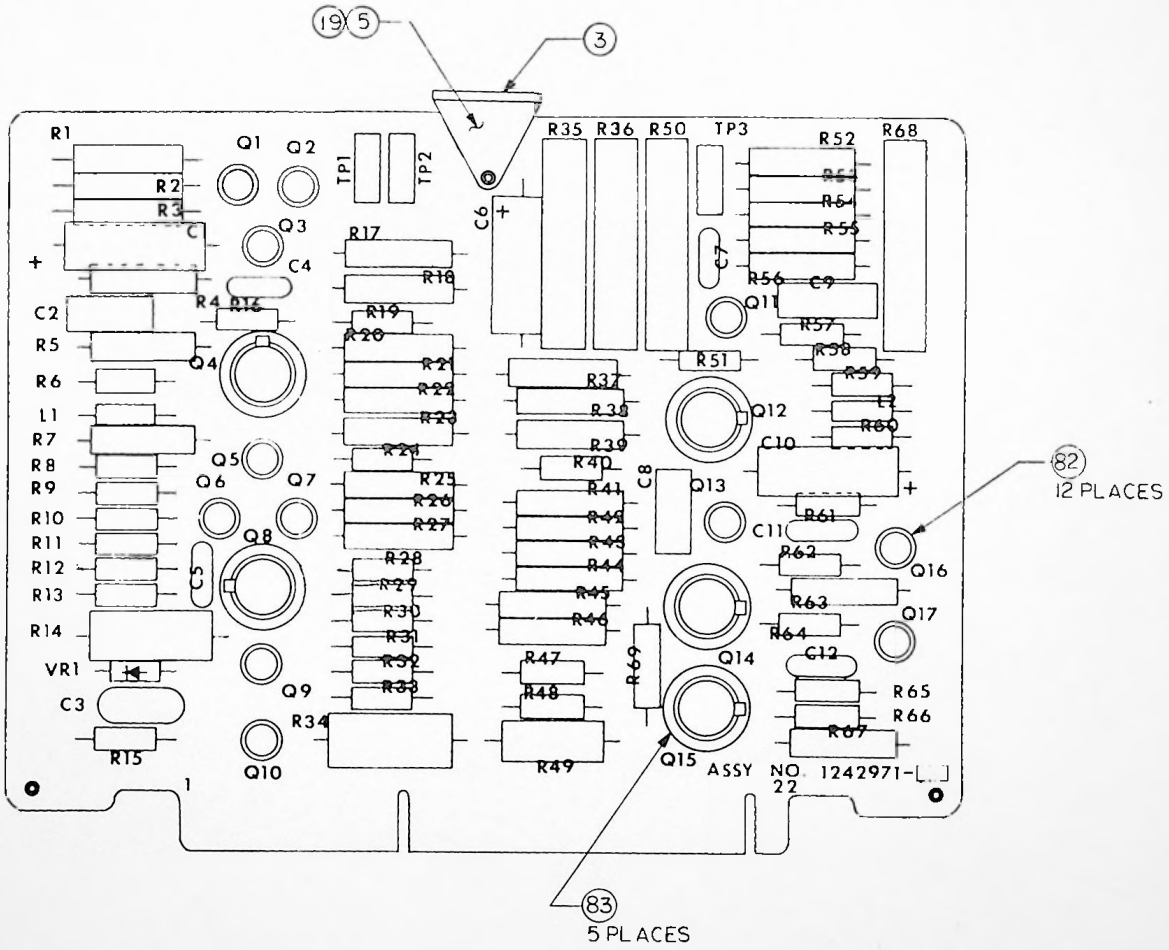
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2	1242979-05			LABEL, Identification		1
3			1385253	SCHEMATIC		REF
4	52528-01			HANDLE		1
6	020-515		K1	RELAY, Armature, dpdt		1
7	020-407			MOUNTING PAD, Relay		1
9	055-157		C1, 2	CAPACITOR, Mylar, .1 μF, 50V, 10%		2
12	148-027		TP2	CONNECTOR, Tip Jack, red		1
13	148-031		TP4	CONNECTOR, Tip Jack, yellow		1
14	148-991		TP3	CONNECTOR, Tip Jack, orange		1
15	148-993		TP1	CONNECTOR, Tip Jack, brown		1
17	280-173			SPACER, Internal Circuit		16
18	280-174			SPACER, Internal Circuit		7
20	586-020		A5, 19	CIRCUIT, Integrated Logic		2
21	586-021		A3, 4, 7, 10, 14, 23	CIRCUIT, Integrated Logic		6
22	586-022		A1, 2, 8, 9, 12, 13, 17, 18, 21, 22	CIRCUIT, Integrated Logic		10
23	586-052		A6, 11, 15, 16, 20	CIRCUIT, Integrated Logic		5



Timing Generator Board No. 7 Printed Wiring Assembly
Dwg. No. 1242968-01

TIMING GENERATOR PRINTED WIRING ASSEMBLY — CATALOG NO. 1242968 — SHEET 1 OF 1 — NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2			1242970	SCHEMATIC		REF
3	1242979-07			LABEL, Identification, board no. 7		1
5	52528-01			HANDLE, Snap-on Circuit Board		1
9	280-173		REF A1, 2, 4, 5, 7, 9, 10, 12, 14, 15, 16, 17, 19, 20, 21, 23, 24, 25	SPACER, Internal Circuit, 8 pin		18
10	280-174		REF A3, 6, 8, 11, 13, 17, 18, 22	SPACER, Internal Circuit, 10 pin		8
12	586-020		A17, 22	CIRCUIT, Integrated Logic, dual three input gate		2
13	586-021		A1, 2, 5, 7, 9, 10, 12, 14, 15, 16, 20, 21, 24, 25	CIRCUIT, Integrated Logic, dual two input gate		14
14	586-022		A4, 19, 23	CIRCUIT, Integrated Logic, buffer		3
15	586-052		A3, 8, 13, 18	CIRCUIT, Integrated Logic, jack flip-flop		4
16	586-051		A6, 11	CIRCUIT, Integrated Logic, quad inverter		2
19	148-027		TP2	CONNECTOR, Printed Circuit Tip Jack, red		1
20	148-029		TP5	CONNECTOR, Printed Circuit Tip Jack, green		1
21	148-030		TP6	CONNECTOR, Printed Circuit Tip Jack, blue		1
22	148-031		TP4	CONNECTOR, Printed Circuit Tip Jack, yellow		1
23	148-991		TP3	CONNECTOR, Printed Circuit Tip Jack, orange		1
24	148-993		TP1	CONNECTOR, Printed Circuit Tip Jack, brown		1



Read Processing Board No. 8 Printed Wiring Assembly
Dwg. No. 1242971-01A

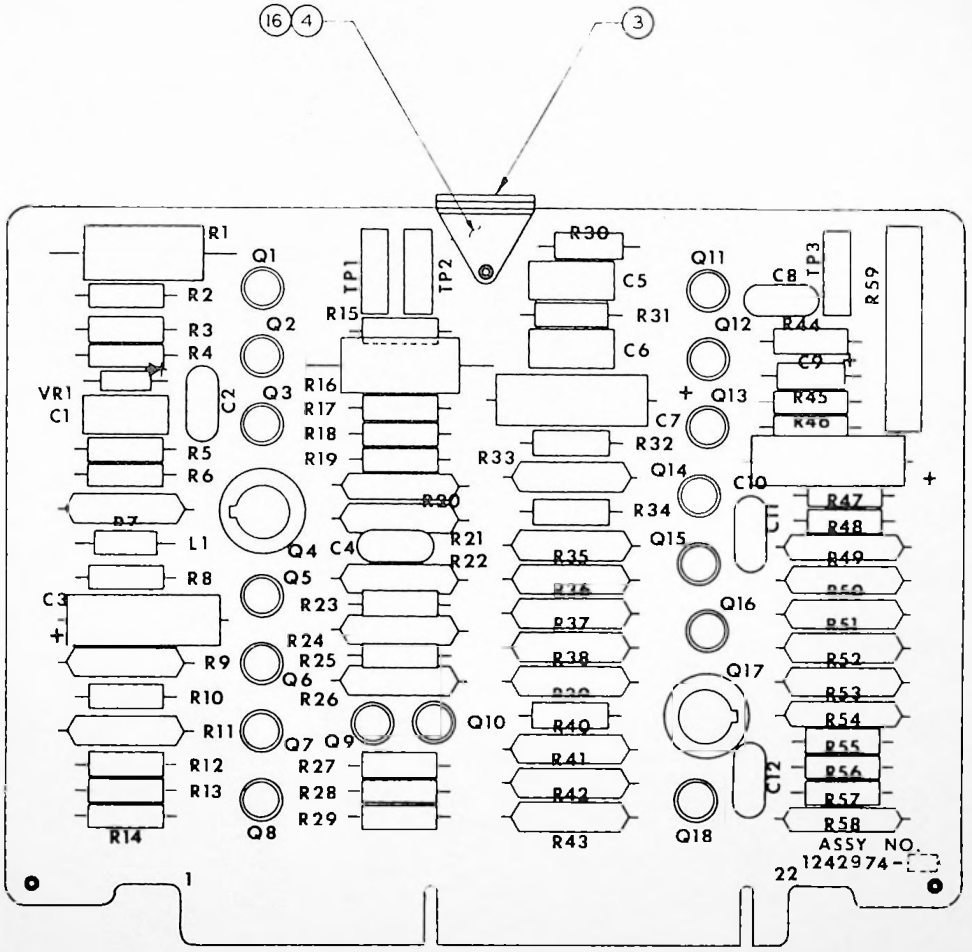
READ PROCESSING BOARD 8 PRINTED WIRING ASSEMBLY — CATALOG NO.1242971 — SHEET 1 OF 3 — NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2			1242973	SCHEMATIC		REF
3	1242979-08			LABEL, Identification, board 8		1
5	52528-01			HANDLE, Snap-on Circuit Board		1
9	013-738	1N4100	VR1	DIODE		1
11	014-248		Q7	TRANSISTOR, CD37		1
12	014-383		Q2, 10	TRANSISTOR, CD441		2
13	014-387		Q5	TRANSISTOR, CD437		1
14	014-505		Q16, 17	TRANSISTOR, CD445		2
15	014-600		Q6, 13	TRANSISTOR, CD507		2
16	014-617		Q1, 3, 9, 11	TRANSISTOR, CD500		4
17	014-628		Q4, 8, 12, 14, 15	TRANSISTOR, CD534		5
20	034-181		C4, 7	CAPACITOR, Mica, 47 pF, 500V, ±5%		2
21	034-328		C12	CAPACITOR, Mica, 100 pF, 500V, ±5%		1
22	034-345		C5	CAPACITOR, Mica, 3 pF, 500V, ±.5 pF		1
23	037-999		C1, 6, 10	CAPACITOR, Tantalum, 47 µF, 20V, ±20%		3
24	055-159		C8, 3	CAPACITOR, Mylar, .047 µF, 50V, ±10%		2
25	055-270		C2, 9	CAPACITOR, Mylar, .012 µF, 50V, ±5%		2
26			C11	CAPACITOR, Factory Select		1
27	041-003		R13, 16, 19, 51, 57, 62, 64, 66, 48	RESISTOR, Composition, 100 ohms, 1/2W, ±5%		9
29	041-013		R11	RESISTOR, Composition, 4700 ohms, 1/2W, ±5%		1
31	041-018		R24	RESISTOR, Composition, 39K, 1/2W, ±5%		1
32	041-020		R9, 32	RESISTOR, Composition, 47K, 1/2W, ±5%		2
33	041-023		R29	RESISTOR, Composition, 100K, 1/2W, ±5%		1
34	041-104		R49	RESISTOR, Composition, 1800 ohms, 1W, ±5%		1
35	041-273		R6, 58	RESISTOR, Composition, 270 ohms, 1/2W, ±5%		2
36	041-282		R8	RESISTOR, Composition, 150 ohms, 1/2W, ±5%		1
37	041-404		R40	RESISTOR, Composition, 510 ohms, 1/2W, ±5%		1
38	041-322		R47	RESISTOR, Composition, 18K, 1/2W, ±5%		1
39	041-357		R28	RESISTOR, Composition, 5600 ohms, 1/2W, ±5%		1

READ PROCESSING BOARD 8 PRINTED WIRING ASSEMBLY				CATALOG NO. 1242971		SHEET 2 OF 3 NHA 1800778						
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01						
40	041-358		R60	RESISTOR, Composition, 62K, 1/2W, ±5%		1						
41	041-420		R61	RESISTOR, Composition, 12K, 1/2W, ±5%		1						
42	041-454		R59	RESISTOR, Composition, 39 ohms, 1/2W, ±5%		1						
43	041-475		R65	RESISTOR, Composition, 3 ohms, 1/2W, ±5%		1						
44	041-481		R14,34	RESISTOR, Composition, 620 ohms, 2W, ±5%		2						
45	041-489		R15,30,31,33	RESISTOR, Composition, 33 ohms, 1/2W, ±5%		4						
47	041-525		R10	RESISTOR, Composition, 3600 ohms, 1/2W, ±5%		1						
48	041-895		R12	RESISTOR, Composition, 1.6 M ohms, 1/2W, ±5%		1						
49	042-457		R17	RESISTOR, Metal Film, 523 ohms, 1/2W, ±1%		1						
50	042-462		R46	RESISTOR, Metal Film, 487 ohms, 1/2W, ±1%		1						
51	042-755		R21	RESISTOR, Metal Film, 1470 ohms, 1/2W, ±1%		1						
52	042-807		R41	RESISTOR, Metal Film, 976 ohms, 1/2W, ±1%		1						
53	048-403		R2	RESISTOR, Metal Film, 499 ohms, 1/2W, ±1%		1						
54	048-409		R4,18	RESISTOR, Metal Film, 24.9K, 1/2W, ±1%		2						
55	048-631		R63	RESISTOR, Metal Film, 604 ohms, 1/2W, ±1%		1						
56	048-667		R37	RESISTOR, Metal Film, 2150 ohms, 1/2W, ±1%		1						
57	048-668		R27	RESISTOR, Metal Film, 1330 ohms, 1/2W, ±1%		1						
58	048-748		R67	RESISTOR, Metal Film, 75 ohms, 1/2W, ±1%		1						
59	048-783		R25	RESISTOR, Metal Film, 3010 ohms, 1/2W, ±1%		1						
60	048-712		R69	RESISTOR, Metal Film, 75 ohms, 1/4W, 1%		1						
61	048-829		R53	RESISTOR, Metal Film, 8450 ohms, 1/2W, ±1%		1						
62	048-969		R43,52,54	RESISTOR, Metal Film, 649 ohms, 1/2W, ±1%		3						
63	057-240		R7	RESISTOR, Metal Film, 2320 ohms, 1/2W, ±1%		1						
64	047-250		R22	RESISTOR, Metal Film, 23.7K, 1/2W, ±1%		1						

READ PROCESSING BOARD 8 PRINTED WIRING ASSEMBLY — CATALOG NO. 1242971 — SHEET 3 OF 3 — NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
65	057-394		R26	RESISTOR, Metal Film, 4020 ohms, 1/2W, ±1%		1
66	057-561		R44	RESISTOR, Metal Film, 2100 ohms, 1/2W, ±1%		1
67	057-624		R1	RESISTOR, Metal Film, 1580 ohms, 1/2W, ±1%		1
68	057-628		R23, 38	RESISTOR, Metal Film, 23.2K, 1/2W, ±1%		2
69	057-629		R3, 20	RESISTOR, Metal Film, 31.6K, 1/2W, ±1%		2
70	057-630		R5, 56	RESISTOR, Metal Film, 2430 ohms, 1/2W, ±1%		2
72	057-631		R39	RESISTOR, Metal Film, 3160 ohms, 1/2W, ±1%		1
73	057-633		R42	RESISTOR, Metal Film, 383 ohms, 1/2W, ±1%		1
74	057-636		R45	RESISTOR, Metal Film, 715 ohms, 1/2W, ±1%		1
75	057-660		R55	RESISTOR, Metal Film, 1870 ohms, 1/2W, ±1%		1
76	058-139		R35, 36	RESISTOR, Variable, wirewound, 200 ohms, 1W, ±10%		2
77	044-231		R50, 68	RESISTOR, Variable, wirewound, 1K, 1W, ±5%		2
79	148-027		TP2	CONNECTOR, Tip Jack, red		1
80	148-991		TP3	CONNECTOR, Tip Jack, orange		1
81	148-993		TP1	CONNECTOR, Tip Jack, brown		1
82	280-130			SPACER, Transistor, TO-18		12
83	280-173			SPACER, Transistor, Internal circuit, 8 pin		5
86	540-016		L2	INDUCTOR, Fixed, 3.9 UH, ±10%		1
87	540-025		L1	INDUCTOR, Fixed, 56 UH, ±5%		1



Write Processing Board No. 9 Printed Wiring Assembly
Dwg. No. 1242974-01A

WRITE PROCESSING BOARD 9 PRINTED WIRING ASSEMBLY	CATALOG NO. 1242974	SHEET 1 OF 3 NHA 1800778

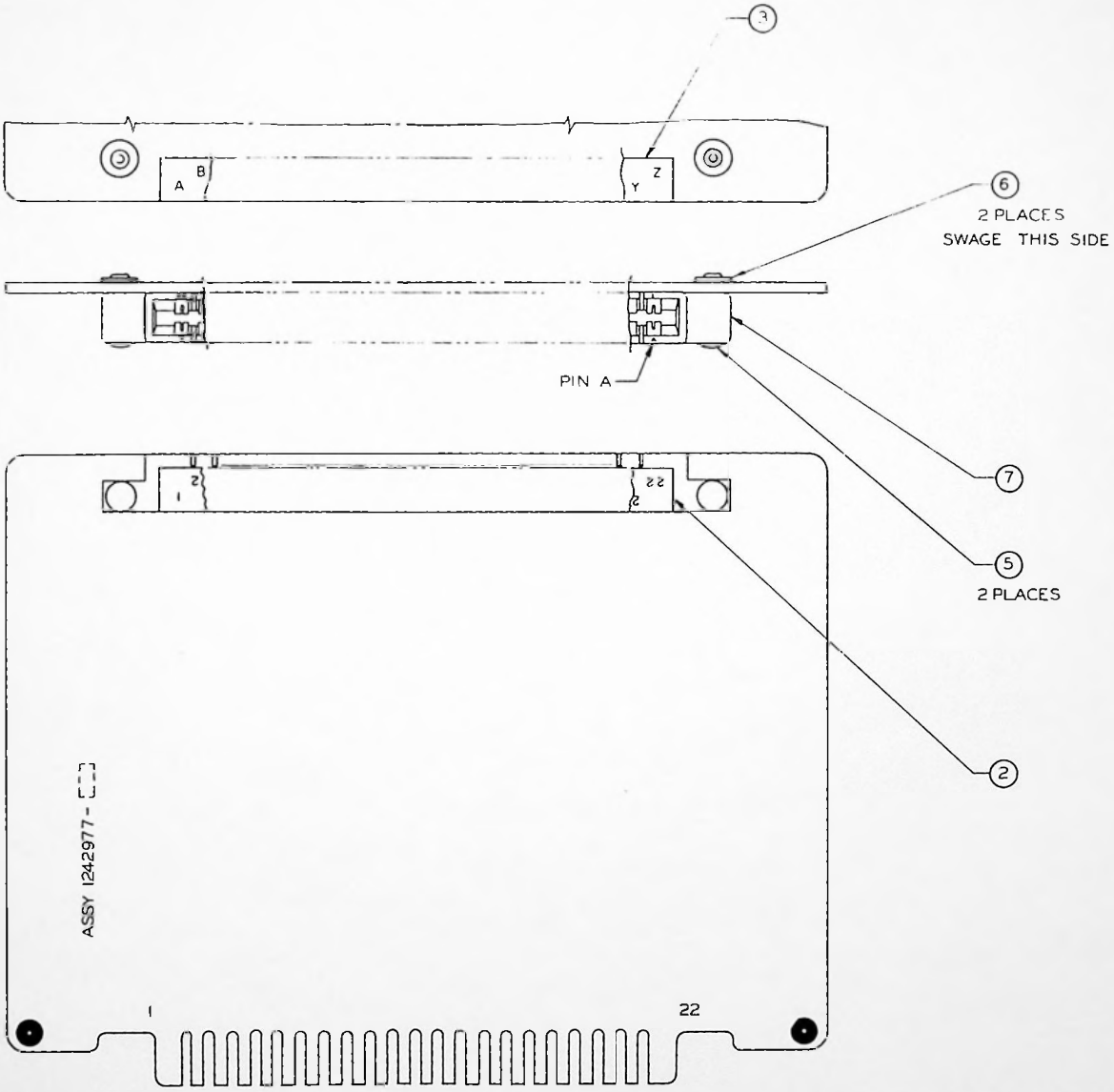
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2			1242976	SCHEMATIC		REF
3	1242979-09			LABEL, Identification, board 9		1
4	52528-01			HANDLE, Snap-on		1
6	013-167		VR1	DIODE, CD32, 8.2V zener		1
7	014-248		Q6, 9, 10	TRANSISTOR, CD37		3
8	014-383		Q11, 14, 15	TRANSISTOR, CD441		3
9	014-387		Q7	TRANSISTOR, CD437		1
10	014-505		Q1	TRANSISTOR, CD445		1
11	014-506		Q2	TRANSISTOR, CD446		1
12	014-600		Q5, 8	TRANSISTOR, CD507		2
13	014-617		Q3, 13, 16, 18	TRANSISTOR, CD500		4
14	014-628		Q4, 17	TRANSISTOR, CD534		2
15	014-505		Q12	TRANSISTOR, CD445		1
17	034-181		C12	CAPACITOR, Mica, 47 pF, 500V, ±5%		1
18	034-215		C8, 11	CAPACITOR, Mica, 10 pF, 500V, ±5%		2
19	034-345		C2, 4	CAPACITOR, Mica, 3 pF, 500V, ±.5 pF		2
20	037-061		C9	CAPACITOR, Tantalum, 6.8 UF, 6V, ±20%		1
21	037-999		C3, 7, 10	CAPACITOR, Tantalum, 47 UF, 20V, ±20%		3
22	055-159		C1	CAPACITOR, Mylar, .047 UF, 50V, ±10%		1
23	055-270		C5, 6	CAPACITOR, Mylar, .012 UF, 50V, ±5%		2
25	041-003		R5, 14, 32, 44, 47, 48, 55, 56	RESISTOR, Carbon Composition, 100 ohms ±5%		8
26	041-012		R23	RESISTOR, Carbon Composition, 4300 ohms, 1/2W, ±5%		1
27	041-013		R13	RESISTOR, Carbon Composition, 4700 ohms, 1/2W, ±5%		1
28	041-016		R12	RESISTOR, Carbon Composition, 39K, 1/2W, ±5%		1
29	041-020		R10	RESISTOR, Carbon Composition, 47K, 1/2W, ±5%		1
30	041-004		R8	RESISTOR, Carbon Composition, 220 ohms, 1/2W, ±5%		1
31	041-273		R6, 34	RESISTOR, Carbon Composition, 270 ohms, 1/2W, ±5%		2
32	041-322		R28, 40	RESISTOR, Carbon Composition, 18K, 1/2W, ±5%		2
33	041-278		R29	RESISTOR, Carbon Composition, 2700 ohms, 1/2W, ±5%		1
35	041-343		R25	RESISTOR, Carbon Composition, 680 ohms, 1/2W, ±5%		1

WRITE PROCESSING BOARD 9 PRINTED WIRING ASSEMBLY — CATALOG NO. 1242974 — SHEET 2 OF 3 — NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
36	041-344		R4	RESISTOR, Carbon Composition, 390 ohms, 1/2W, ±5%		1
37	041-357		R31,46	RESISTOR, Carbon Composition, 5600 ohms, 1/2W, ±5%		2
38	041-404		R27	RESISTOR, Carbon Composition, 510 ohms, 1/2W, ±5%		1
39	041-405		R30	RESISTOR, Carbon Composition, 1200 ohms, 1/2W, ±5%		1
40	041-420		R3	RESISTOR, Carbon Composition, 12K, 1/2W, ±5%		1
41	041-455		R19	RESISTOR, Carbon Composition, 6200 ohms, 1/2W, ±5%		1
42	041-475		R45,57	RESISTOR, Carbon Composition, 3K, 1/2W, ±5%		2
43	041-481		R1,16	RESISTOR, Carbon Composition, 620 ohms, 2W, ±5%		2
44	041-489		R2,15,17,18	RESISTOR, Carbon Composition, 33 ohms, 1/2W, ±5%		4
46	044-229		R59	RESISTOR, Variable, wirewound, 500 ohms, 1W, ±10%		1
48	042-458		R58	RESISTOR, Metal Film, 4420 ohms, 1/2W, ±1%		1
49	042-757		R33	RESISTOR, Metal Film, 1960 ohms, 1/2W, ±1%		1
50	048-140		R50	RESISTOR, Metal Film, 2210 ohms, 1/2W, ±1%		1
52	048-403		R43	RESISTOR, Metal Film, 499 ohms, 1/2W, ±1%		1
53	048-420		R35	RESISTOR, Metal Film, 232K, 1/2W, ±1%		1
54	048-631		R37	RESISTOR, Metal Film, 604 ohms, 1/2W, ±1%		1
55	048-668		R24,53	RESISTOR, Metal Film, 1330 ohms, 1/2W, ±1%		2
56	048-777		R7	RESISTOR, Metal Film, 16.9K, 1/2W, ±1%		1
57	048-783		R26,39	RESISTOR, Metal Film, 3010 ohms, 1/2W, ±1%		2
58	048-794		R20	RESISTOR, Metal Film, 1000 ohms, 1/2W, ±1%		1
59	048-795		R51	RESISTOR, Metal Film, 590 ohms, 1/2W, ±1%		1
60	048-900		R49	RESISTOR, Metal Film, 9760 ohms, 1/2W, ±1%		1
62	048-969		R38	RESISTOR, Metal Film, 649 ohms, 1/2W, ±1%		1
63	057-240		R11	RESISTOR, Metal Film, 2320 ohms, 1/2W, ±1%		1
64	057-394		R9,21	RESISTOR, Metal Film, 4020 ohms, 1/2W, ±1%		2

WRITE PROCESSING BOARD 9 PRINTED WIRING ASSEMBLY	CATALOG NO. 1242974	SHEET 3 OF 3
		NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
65	057-547		R52, 54	RESISTOR, Metal Film, 1150 ohms, 1/2W, ±1%		2
66	057-625		R36	RESISTOR, Metal Film, 21K, 1/2W, ±1%		1
67	057-626		R22	RESISTOR, Metal Film, 22.6K, 1/2W, ±1%		1
68	057-562		R42	RESISTOR, Metal Film, 806 ohms, 1/2W, ±1%		1
69	057-659		R41	RESISTOR, Metal Film, 1050 ohms, 1/2W, ±1%		1
71	051-300		L1	INDUCTOR, 270 UH, ±5%		1
72	148-027		TP2	CONNECTOR, Tip Jack, red		1
73	148-991		TP3	CONNECTOR, Tip Jack, orange		1
74	148-993		TP1	CONNECTOR, Tip Jack, brown		1
76	280-130			SPACER, Transistor		16
77	280-173			SPACER, Internal Circuit, 8 pin		2



Extender Board Printed Wiring Assembly
Dwg. No. 1242977-01A

PRINTED WIRING ASSEMBLY EXTENDER BOARD

CATALOG NO. 1242977

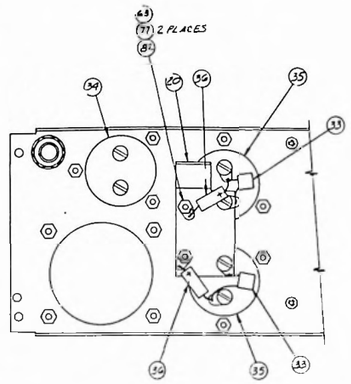
SHEET 1 OF 1

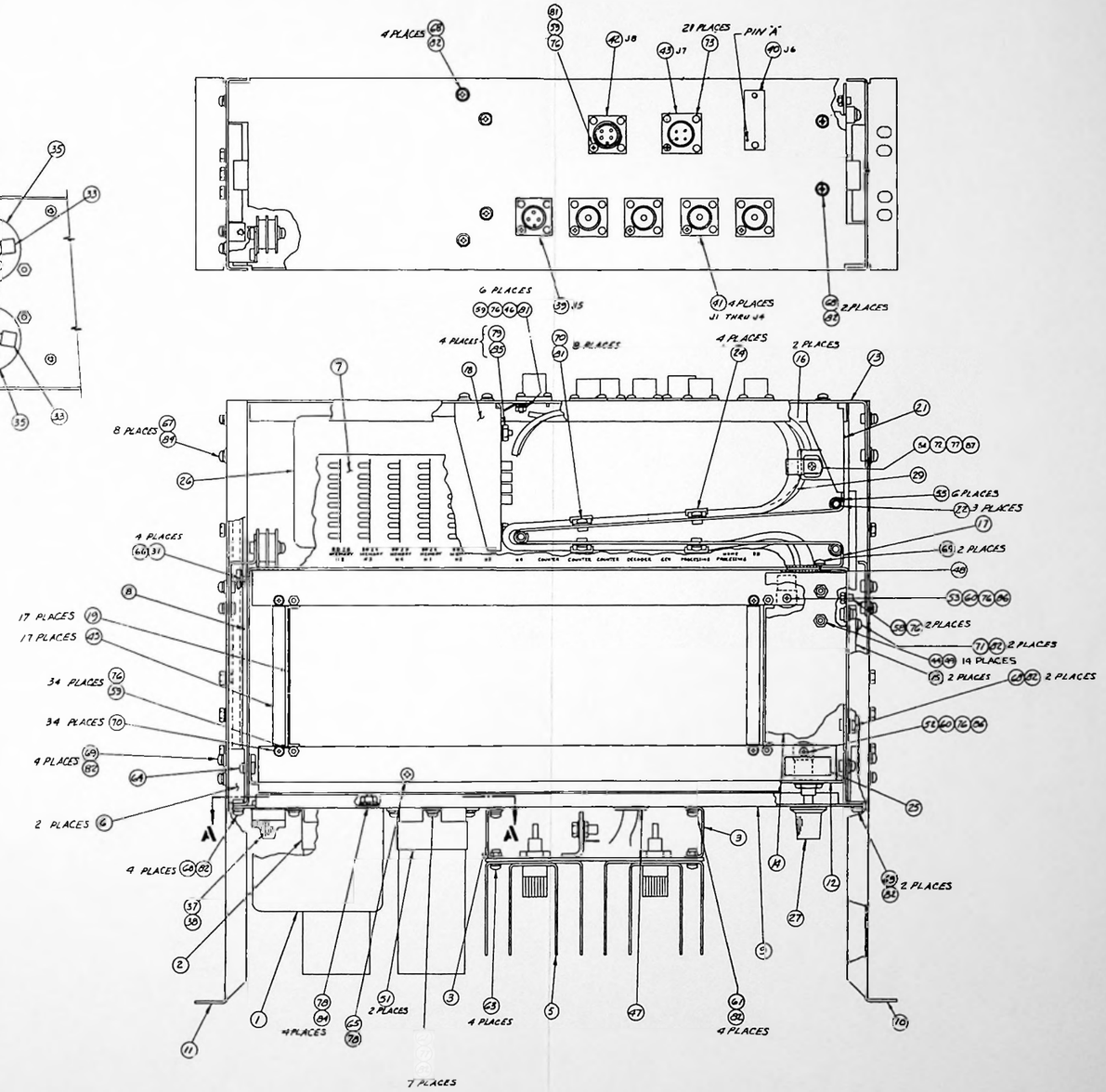
NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2	1209800-01			LABEL, Extender Card		1
3	1209800-02			LABEL, Extender Card		1
5	460-068			RIVET, 1/2 Long		2
6	503-994			WASHER, Fiber		2
7	143-446			CONNECTOR		1

1242977A

6.2-43/44





Velocity Compensator Chassis Assembly
Dwg. No. 1360013-02F

VELOCITY COMPENSATOR CHASSIS ASSEMBLY

CATALOG NO. 1360013

SHEET 1 OF 3

NHA 1800778

ITEM NO	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02
1	52497-02		T001	TRANSFORMER		1
2	52538-01			CLAMP CAPACITOR		1
3	52572-02			BRACKET, Heat Sink		2
5	52580-01			HEAT SINK ASSEMBLY		1
6	1211008-10			BLOCK, Shipping Bolt		2
7	1242980-01			LABEL, Identification, chassis		1
8	1360014-01			CHASSIS		1
9	1360015-01			PANEL, Front		1
10	1360016-01			SLIDE AND BRACKET ASSEMBLY		1
11	1360016-02			SLIDE AND BRACKET ASSEMBLY		1
12	1360020-01			PANEL, Board Support		1
13	1360021-01			BRACKET CONNECTOR		1
14	1360022-01			BRACKET TEST		1
15	1360023-01			LATCH ARM		2
16	1360024-01			PLATE HINGE		2
17	1360025-01			BRACKET, Hinge, front		1
18	1360026-01			BRACKET, Power Supply Mounting		1
19	1360027-01			BRACKET, Connector Grounding		17
20	1360028-01			STRAP, Grounding		1
21	1360029-02			BRACKET, Hinge, rear		1
22	1360031-01			PIN, Hinge		3
24	1361014-01			CLAMP ASSEMBLY		4
25	1380001-01			SWITCH, Rotary		1
26	1380002-01			POWER SUPPLY, Voltage Regulated, 3.6V, 2 amp		1
27	6000006-20			KNOB, 5/8 series		1
29	1360056-02			HARNESS ASSEMBLY		1
30			1385260	SCHEMATIC		REF
33	030-094		C004, 006	CAPACITOR, 1 mfd, 25V		2
34	031-954		C001	CAPACITOR, 3000 mfd, 50V, -10 +75%		1
35	031-955		C002, 003	CAPACITOR, 9000 mfd, 15V, -10 +100%		2
36	037-999		C005, 007	CAPACITOR, 47 mfd, 20 Vdc		2
37	070-048		F001	FUSE, 0.75 amp, slo-blo		1
38	130-017			FUSE HOLDER, 125V		1
39	143-997		J5	CONNECTOR, Receptacle, male, 3 pin		1
40	145-393		J6	CONNECTOR, Receptacle, male, 26 pin		1
41	146-067		J1-4	CONNECTOR, Receptacle, male, 1 pin		4

VOLOCITY COMPENSATOR CHASSIS ASSEMBLY				CATALOG NO. 1360013		SHEET 2 OF 3 NHA 1800778						
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02						
42	146-315		J8	CONNECTOR, Receptacle, male, 4 pin		1						
43	147-146		J7	CONNECTOR, Receptacle, male, 4 pin		1						
44	148-012		TP001-014	CONNECTOR, Tip Jack		14						
45	168-086			CONNECTOR, Female, 22 pin		17						
46	172-004			TERMINAL, Lug, solder, #4		6						
47	260-004			GROMMET, 7/8 OD x 3/8 ID		1						
48	260-078			GROMMET, Caterpillar Type		A/R						
49	172-029			TERMINAL LUG, Solder, 1/4 stud		14						
51	301-998			CLAMP, Capacitor		2						
52	302-006			CLAMP, Cable, 7/16 ID		1						
53	302-007			CALMP, Cable, 1/4 ID		1						
54	302-036			CLAMP, Cable, 3/8 ID		1						
55	430-005			RING, Retaining, external, 1/4		6						
58	470-008			SCREW, Machine, cap, socket, 4-40 x 1/4 long		2						
59	471-061			SCREW, Machine, pan head, 4-40 x 5/16 long		41						
60	471-062			SCREW, Machine, pan head, 4-40 x 3/8 long		2						
61	471-069			SCREW, Machine, pan head, 6-32 x 3/8 long		11						
63	471-071			SCREW, Machine, pan head, 6-32 x 1/2 long		6						
64	471-486			SCREW, Machine, binder head, 6-32 x 1/4 long		4						
65	471-344			SCREW, Machine, flat head, 8-32 x 5/16 long		1						
66	471-345			SCREW, Machine, flat head, 8-32 x 3/8 long		4						
67	475-092			SCREW, Sem, pan head, 8-32 x 3/8 long		8						
68	475-049			SCREW, Sem, pan head, 6-32 x 3/8 long		12						
69	475-085			SCREW, Sem, pan head, 6-32 x 5/16 long		6						
70	475-055			SCREW, Sem, pan head, 4-40 x 5/16 long		42						
71	475-081			SCREW, Sem, pan head, 6-32 x 1/4 long		4						
72	471-070			SCREW, Machine, pan head, 6-32 x 7/16 long		1						
73	476-003			SCREW, Self Tapping, pan head, 4 x 1/4 long		21						
76	496-004			NUT, Hex, keps, 4-40		45						
77	496-005			NUT, Hex, keps, 6-32		10						
78	496-006			NUT, Hex, keps, 8-32		5						

VELOCITY COMPENSATOR CHASSIS ASSEMBLY

CATALOG NO. 1360013

NHA 1800778

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02						
79	496-007			NUT, Hex, keps, 10-32		4						
81	501-008			WASHER, Flat, #4		15						
82	501-009			WASHER, Flat, #6		33						
84	501-010			WASHER, Flat, #8		12						
85	501-011			WASHER, Flat, #10		4						
86	506-021			WASHER, D		2						
87	506-013			WASHER, D		1						

HEAT SINK FRONT PANEL ELECTRONICS SUBASSEMBLY
AMTEC/COLORTEC, PROCESSING AMPLIFIER

CATALOG NO. 52580

SHEET 1 OF 1

NHA 1360013

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
1	1360961-01			HEAT SINK FRONT PANEL SUBASSEMBLY		1
3	014-982	2N456A	Q002, 003	TRANSISTOR		2
4	013-149	1N1124	CR001-006	DIODE		6
5	014-985	2N511	Q001	TRANSISTOR		1
8	043-976		R002	RESISTOR, Fixed, wirewound, 7 ohms, 25W, 3%		1
9	043-977		R001	RESISTOR, Fixed, wirewound, 5 ohms, 25W, 3%		1
11	172-003			SOLDERING LUG, #6, internal tooth		6
12	280-994			SPACER, Insulated		3
13	302-037			CLAMP, Cable, 5/16 diameter		1
14	496-002			NUT, Keps, #6-32		2
15	475-062			SCREW, Sem, cross recessed drive, pan head, 6-32 x 5/8		6
16	492-003			NUT, Hex, 6-32		6
17	501-009			WASHER, Flat, #6		7
18	502-025			WASHER, Lock, #6, internal tooth		7
19	503-013			WASHER, Fiber, shoulder, #8		6
20	503-994			WASHER, Flat, fiber, #6, 1/4"		6
21	475-047			SCREW, Machine, pan head, #6-32 x 7/8		7
22	506-013			WASHER, "D", cable clamp		1
25	503-999			WASHER, Mica Silicone, .196 ID x .625 OD x .002 thick		A/R

VELOCITY COMPENSATOR INSTALLATION KIT — CATALOG NO. 1805184 — SHEET 1 OF 2 — NHA 1805140

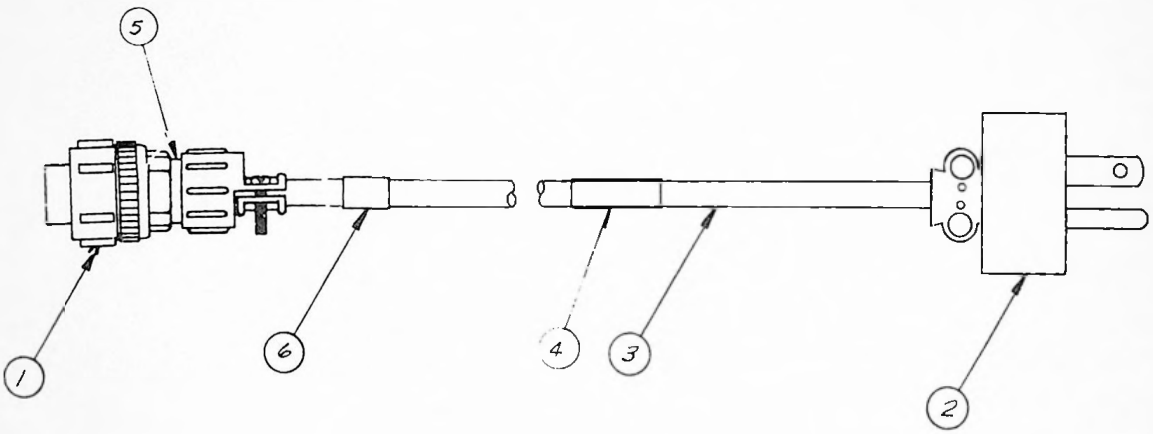
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -05	-06	-07
1	52596-02			CABLE, AC Power		1	1	1
3	1385549			INTERCONNECTION DIAGRAM, VR-1200B		-	REF	REF
4	1360008-01			PRINTED WIRING ASSEMBLY BOARD #6 (AMTEC)		1	1	1
17	1361793-02			CABLE, Head Switching (Signal System J23)		-	1	-
19	1360415-01			HARNESS, AMTEC		1	1	1
21	1361795-04			CABLE, Interconnect (COLORTEC J13)		-	1	-
22	034-213		C3	CAPACITOR, Mica, 150 pF, 500V, ±5%		1	1	1
23	034-199		C3	CAPACITOR, Mica, 300 pF, 500V, ±5%		1	1	1
24	034-888		C3	CAPACITOR, Mica, 430 pF, 500V, ±5%		1	1	1
25	034-931		C3	CAPACITOR, Mica, 560 pF, 300V, ±5%		1	1	1
26	034-930		C3	CAPACITOR, Mica, 680 pF, 300V, ±5%		1	1	1
27	034-283		C3	CAPACITOR, Mica, 820 pF, 300V, ±5%		1	1	1
28	034-386		C3	CAPACITOR, Mica, 910 pF, 100V, ±5%		1	1	1
29	034-950		C3	CAPACITOR, Mica, 1000 pF, 100V, ±5% NOTE CAPACITOR C3 FOR USE WITH AMTEC BD #6. VALUE TO BE SELECTED AT TIME OF INSTALLATION.		1	1	1
30	1361795-05			CABLE, Interconnect (Signal System J8)		-	1	-
31	169-005			CONNECTOR, UHF, elbow		1	1	1
32	169-012			CONNECTOR, UHF, tee		1	1	1
33	296-004			LACING CORD, Black, 30 feet long		1	1	1
34	471-463			SCREW, Pan Head, 12-24 x 3/8		10	10	10
35	475-055			SCREW, Sem, 4-40 x 5/16		2	-	2
37	475-049			SCREW, Sem, 6-32 x 3/8		2	-	2
46	1361795-06			CABLE, Interconnect (AMTEC J4)		-	1	1
49	600-161			SLEEVING, Teflon, #22, 1 LG		4	4	4
53	1360061-01			BLANK PANEL		1	-	1
54	1361796-02			CABLE, Interconnect (COLORTEC J8)		-	1	-
55	1361797-02			CABLE, Error Signal (AMTEC J7)		-	1	-
59	1385286			INTERCONNECT DIAGRAM, VR-1200		REF	-	-
62	1361186-02			BRACKET, Chassis Support		2	2	2
71	1361363-01			PRINTED WIRING ASSEMBLY, Head Decoder		1	1	1
72	1361792-01			CABLE, Interconnect (Switch Panel Waveform Monitor J9)		1	-	-
73	1361793-01			CABLE, Head Switching (Signal System J23)		1	-	-

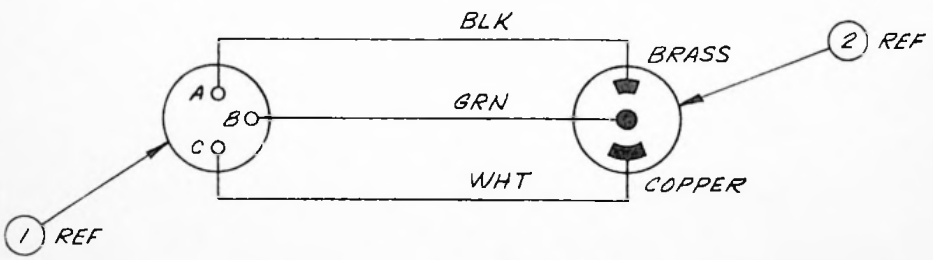
VELOCITY COMPENSATOR INSTALLATION KIT

CATALOG NO. 1805184

NHA 1805140

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -05	-06	-07
74	1361794-01			LABEL, Waveform Monitor		2	-	-
75	1361795-01			CABLE, Interconnecting (COLORTEC J13)		1	-	1
76	1361795-02			CABLE, Interconnecting (Signal System J8)		1	-	1
77	1361795-03			CABLE, Interconnecting (AMTEC J4)		1	-	1
78	1361796-01			CABLE, Interconnecting (COLORTEC J8)		1	-	1
79	1361797-01			CABLE, Error Signal (AMTEC J7)		1	-	1
80	1361798-01			HARNESS ASSEMBLY, Signal System		1	-	1
81	1361799-01			BRACKET, Support, right rear		1	-	1
82	1361800-01			BRACKET, Support, left rear		1	-	1
83	1361793-01			CABLE, Head Switching		-	-	1





A.C. Cable Jumper Assembly
Dwg. No. 52596-02E

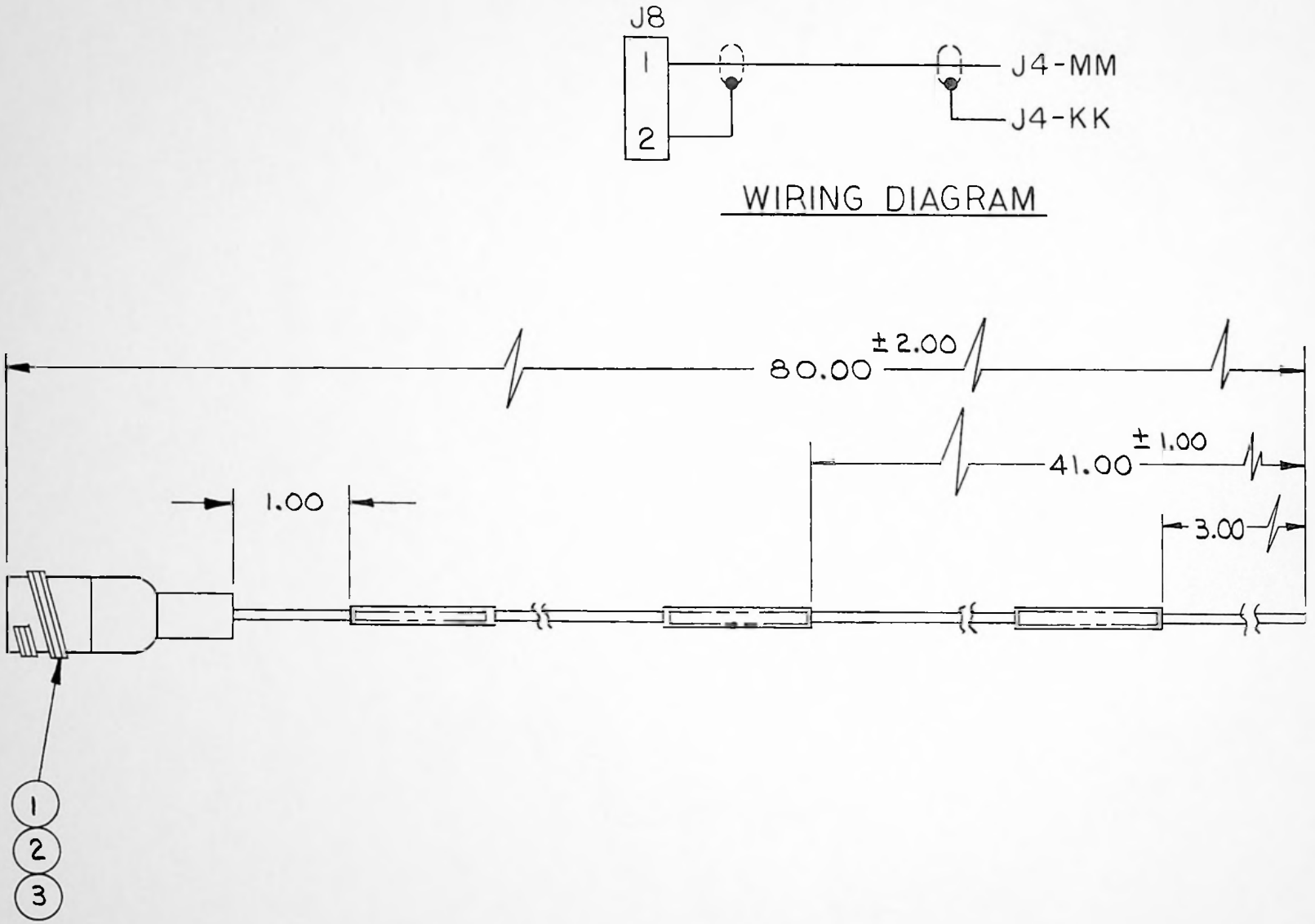
AC CABLE JUMPER ASSEMBLY

CATALOG NO. 52596

SHEET 1 OF 1

NHA 1805140

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -02
1	140-998			CONNECTOR PLUG, Female, 3 contact		1
2	147-053			CONNECTOR PLUG, Male, 3 contact		1



Interconnect Cable Assembly
Dwg. No. 1361792

6.2-59/60

AMPEX

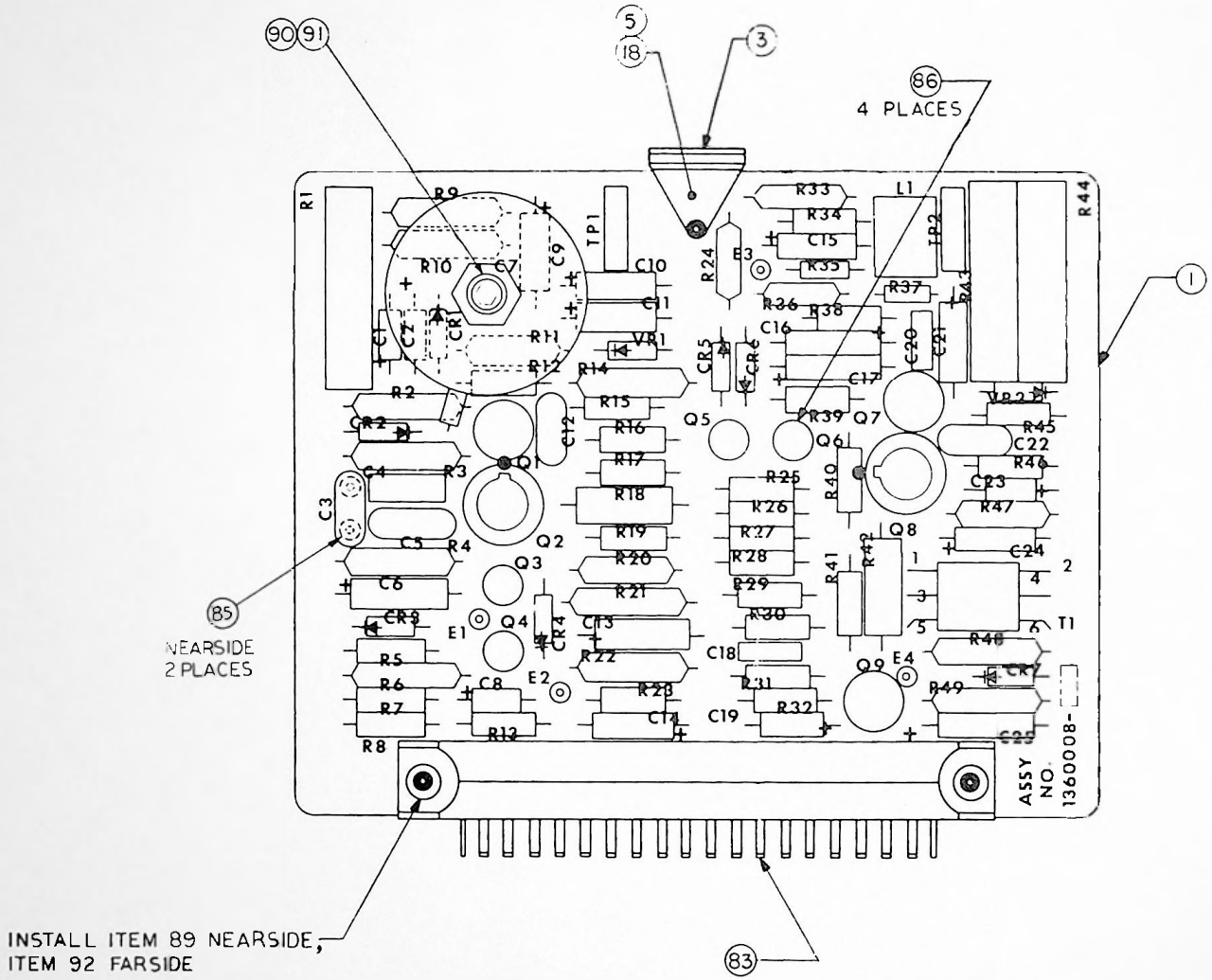
INTERCONNECT CABLE ASSEMBLY

CATALOG NO. 1361792

SHEET 1 OF 1

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
1	145-368		J8	CONNECTOR, Cir Plug, 4 pins, female shell		1
2	262-001			BUSHING, Telescoping, .130 ID; .210 OD		2
3	262-002			BUSHING, Telescoping		1



Amtec Error Detector Board No. 6 Printed Wiring Assembly
Dwg. No. 1360008-01A

AMPEX

AMTEC ERROR DETECTOR PRINTED WIRING ASSEMBLY — CATALOG NO. 1360008 — SHEET 1 OF 3 — NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2			1385002	SCHEMATIC DIAGRAM		REF
3	1209444-06			LABEL, Identification, board 6		1
5	52528-01			SNAP-ON HANDLE, Circuit Board		1
7	013-183	1N821	VR1, 2	DIODE, Zener		2
8	013-655	FD600	CR5, 6	DIODE		2
9	013-985	1N660	CR1-4, 7	DIODE		5
11	014-248		Q3, 5	TRANSISTOR, CD37		2
12	014-364		Q1	TRANSISTOR, CD438		1
13	014-387		Q4, 6	TRANSISTOR, CD437		2
14	014-628		Q2, 8	TRANSISTOR, CD534		2
15	014-730	2N3502	Q7	TRANSISTOR		1
16	014-988	2N1305	Q9	TRANSISTOR		1
20	035-828		C20	CAPACITOR, Mylar, .022 UF, 50V, ±5%		1
21	035-837		C4	CAPACITOR, Mylar, .1 UF, 50V, ±10%		1
22	035-844		C18	CAPACITOR, Mylar, .001 UF, 50V, ±10%		1
24	037-058		C8, 19, 23	CAPACITOR, Tantalum, .1 UF, 35V, ±20%		3
25	037-449		C15, 21	CAPACITOR, Tantalum, 39 UF, 10V, ±10%		2
26	037-989		C1, 2	CAPACITOR, Tantalum, 2.2 UF, 20V, ±10%		2
27	037-990		C14, 16, 17	CAPACITOR, Tantalum, 15 UF, 20V, ±20%		3
28	037-991		C9, 10, 24	CAPACITOR, Tantalum, 22UF, 15V, ±10%		3
29	037-992		C6, 11, 13, 25	CAPACITOR, Tantalum, 33 UF, 10V, ±20%		4
31	034-368		C5	CAPACITOR, Mica, 5100 pF, 300V, ±5%		1
32	034-944		C12	CAPACITOR, Mica, 20 pF, 500V, ±5%		1
33	034-209		C22	CAPACITOR, Mica, 5 pF, 500V, ±10%		1
35	038-007		C7	CAPACITOR, Variable, cermet, 50-250 pF 500V		1
38	041-002		R29	RESISTOR, Composition, 10 ohms, 1/2W, 5%		1
39	041-003		R17, 28, 39	RESISTOR, Composition, 100 ohms, 1/2W, 5%		3
40	041-004		R15, 38	RESISTOR, Composition, 220 ohms, 1/2W, 5%		2
41	041-008		R8	RESISTOR, Composition, 1500 ohms, 1/2W, 5%		1
42	041-013		R40	RESISTOR, Composition, 4700 ohms, 1/2W, 5%		1

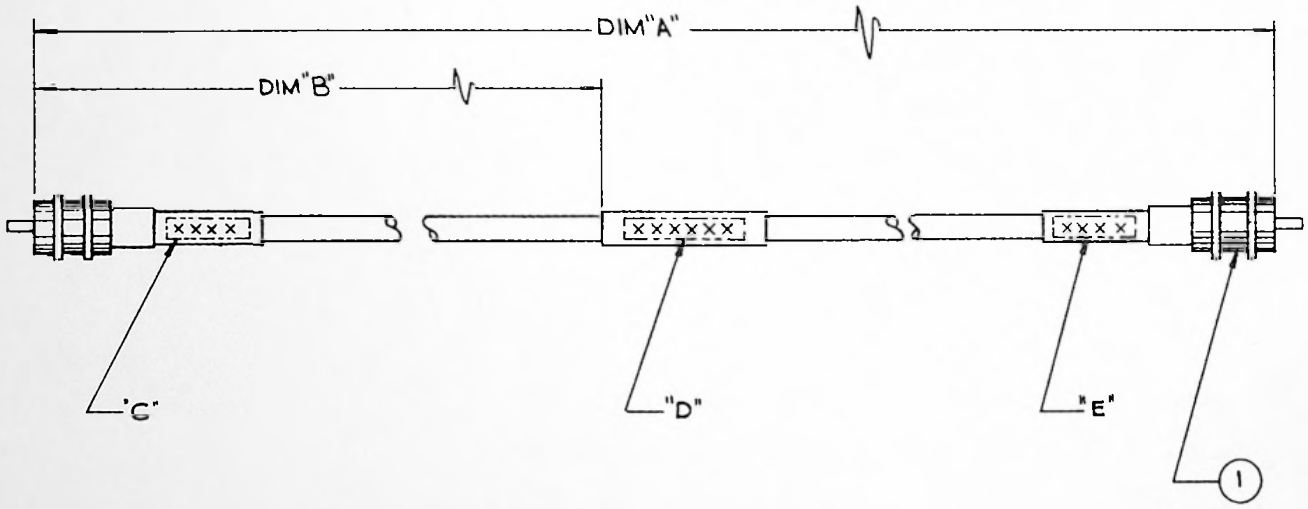
AMTEC ERROR DETECTOR PRINTED WIRING ASSEMBLY — CATALOG NO. 1360008 — SHEET 2 OF 3 — NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
43	041-015		R19	RESISTOR, Composition, 27K, 1/2W, 5%		1
44	041-023		R7	RESISTOR, Composition, 100K, 1/2W, 5%		2
45	041-102		R18,42	RESISTOR, Composition, 1K, 1W, 5%		2
46	041-245		R26,27	RESISTOR, Composition, 1K, 1/2W, 5%		2
47	041-256		R13,32	RESISTOR, Composition, 560 ohms, 1/2W, 5%		2
48	041-303		R25	RESISTOR, Composition, 3900 ohms, 1/2W, 5%		1
49	041-316		R31	RESISTOR, Composition, 2400 ohms, 1/2W, 5%		1
50	041-326		R30	RESISTOR, Composition, 300K, 1/2W, 5%		1
51	041-330		R16,23	RESISTOR, Composition, 6800 ohms, 1/2W, 5%		2
52	041-334		R45	RESISTOR, Composition, 200 ohms, 1/2W, 5%		1
53	041-425		R37	RESISTOR, Composition, 47 ohms, 1/2W, 5%		1
54	041-454		R5	RESISTOR, Composition, 39 ohms, 1/2W, 5%		1
55	041-475		R46	RESISTOR, Composition, 3000 ohms, 1/2W, 5%		1
56	041-498		R41	RESISTOR, Composition, 24K, 1/2W, 5%		1
57	041-888		R12	RESISTOR, Composition, 5.6 M ohms, 1/2W, 5%		1
58	041-965		R34	RESISTOR, Composition, 6.2 M ohms, 1/2W, 5%		1
59	043-978		R35	RESISTOR, Fixed, wirewound, 7.5 ohms, 1/2W, 1%		1
61	044-873		R1	RESISTOR, Variable, cermet, 1000 ohms, 1W, 10%		1
62	058-132		R44	RESISTOR, Variable, cermet, 100K, 1W, 10%		1
64	048-133		R49	RESISTOR, Fixed, metal film, 22.1K, 1/2W, 1%		1
65	048-156		R14	RESISTOR, Fixed, metal film, 5110 ohms, 1/2W, 1%		1
66	048-403		R2	RESISTOR, Fixed, metal film, 499 ohms, 1/2W, 1%		1
67	048-704		R4,22	RESISTOR, Fixed, metal film, 301 ohms, 1/2W, 1%		2
68	048-712		R47	RESISTOR, Fixed, metal film, 75 ohms, 1/4W, 1%		1
69	048-794		R6	RESISTOR, Fixed, metal film, 1000 ohms, 1/2W, 1%		1
70	048-893		R21	RESISTOR, Fixed, metal film, 909 ohms, 1/2W, 1%		1

AMTEC ERROR DETECTOR PRINTED WIRING ASSEMBLY — CATALOG NO. 1360008 — SHEET 3 OF 3 — NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
71	048-946		R3	RESISTOR, Fixed, metal film, 432 ohms, 1/2W, 1%		1
72	051-335		L1	INDUCTOR, Variable, 1.5 UH		1
74	057-042		R11	RESISTOR, Fixed, metal film, 10K, 1/4W, 1%		1
75	057-424		R33	RESISTOR, Fixed, metal film, 1820 ohms, 1/4W, 1%		1
76	057-583		R48	RESISTOR, Fixed, metal film, 5490 ohms, 1/2W, 1%		1
77	057-584		R9, 10	RESISTOR, Fixed, metal film, 121K, 1/2W, 1%		2
78	057-658		R20	RESISTOR, Fixed, metal film, 267 ohms, 1/4W, 1%		1
79	057-661		R24, 36	RESISTOR, Fixed, metal film, 13 ohms, 1/4W, 1%		2
80	058-078		R43	RESISTOR, Variable, cermet, 2000 ohms, 1W, 5%		1
83	145-991		P1	CONNECTOR, 18 pin		1
84	148-028		TP1, 2	JACK, Test Point, white		2
85	169-775			PIN, Socket		2
86	280-130			SPACER, Transistor		4
87	280-173			SPACER, Internal Circuit, 8 pin		2
88	280-998			SPACER, Transistor, TO-5		3
89	460-068			RIVET		2
90	470-020			SCREW, Cap, 6-32 x 1/2		1
91	502-014			WASHER, Lock, external tooth, #6		1
92	503-994			WASHER, Non-metallic, #6		2
94	560-250		T1	TRANSFORMER		1

VERSION TABULATION					
VERSION	DIM."A"	DIM."B"	FUNCTION DESIGNATION		
			DESIGNATION"C"	ASSY NO"D"	DESIGNATION"E"
-01	41.00	20.00	VEL COMP J 1	ASSY 1361795-01	COLORTEC J13
-02	51.00	25.00	VEL COMP J 2	ASSY 1361795-02	SIG SYS J8
-03	47.00	24.00	VEL COMP J 3	ASSY 1361795-03	AMTEC J4
-04	141.00	70.00	VEL COMP J1	ASSY 1361795-04	COLORTEC J13
-05	151.00	75.00	VEL COMP J2	ASSY 1361795-05	SIG SYSTEM J8
-06	147.00	74.00	VEL COMP J3	ASSY 1361795-06	AMTEC J4



Interconnect Cable Assembly
Dwg. No. 1361795

AMPEX

INTERCONNECT CABLE ASSEMBLY

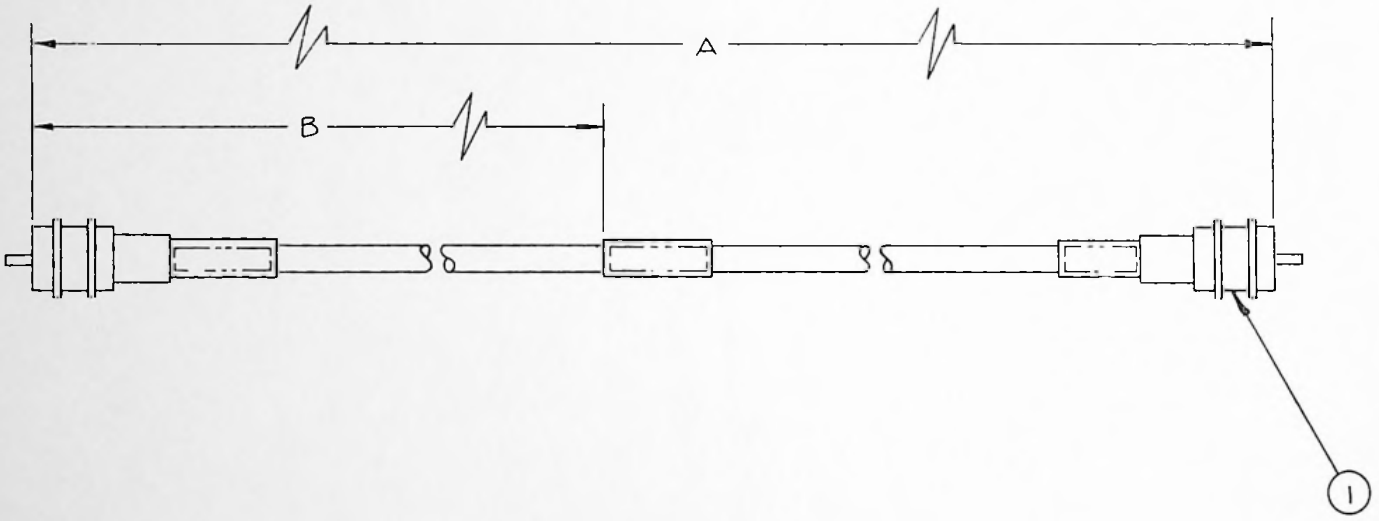
CATALOG NO. 1361795

SHEET 1 OF 1

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION						
						-01	-02	-03	-04	-05	-06	
1	143-265			CONNECTOR, Plug, 1 pin		2	2	2	2	2	2	

VERSION TABULATION		
VERSION	DIM "A"	DIM "B"
-01	48.00	24.00
-02	148.00	74.00



Interconnect Cable Assembly
Dwg. No. 1361796A

AMPEX

INTERCONNECT CABLE ASSEMBLY

CATALOG NO. 1361796

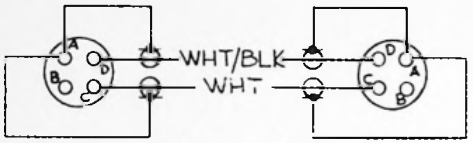
SHEET 1 OF 1

NHA 1805184

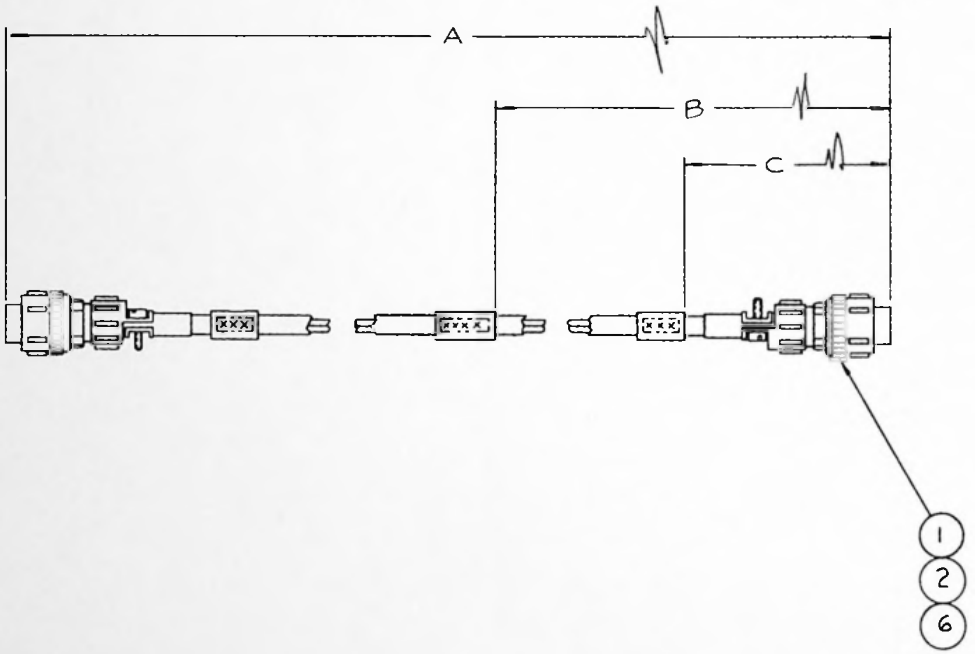
ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01	-02					
1	143-264			CONNECTOR, Plug, 1 pin		2	2					

1361796A

VERSION TABULATION			
VERSION	DIM. "A"	DIM. "B"	DIM. "C"
-01	41.00	20.00	4.00±.25
-02	141.00	70.00	4.00±.25



WIRING DIAGRAM



Error Signal Cable Assembly
Dwg. No. 1361797B

AMPEX

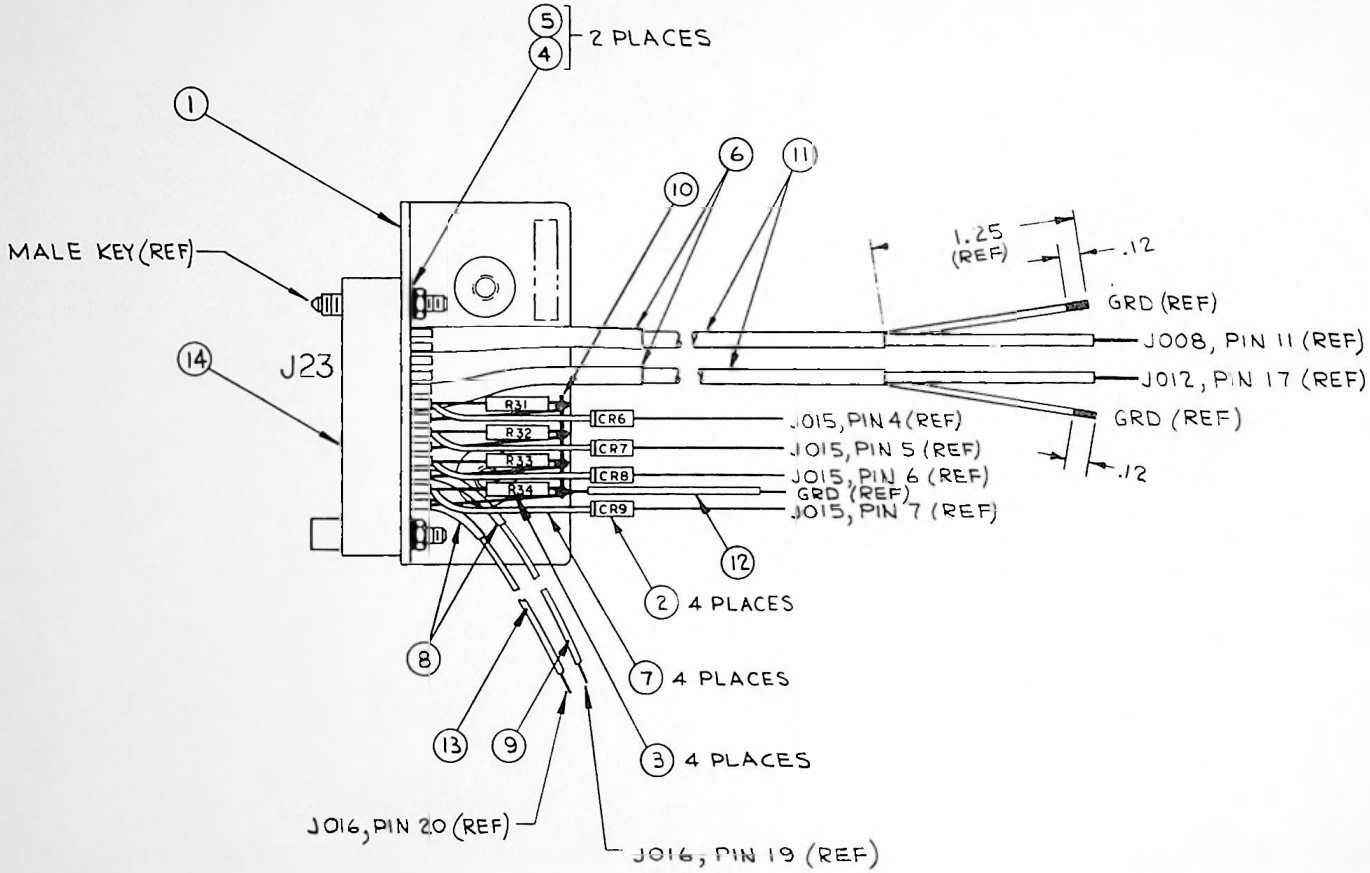
ERROR SIGNAL CABLE ASSEMBLY

CATALOG NO. 1361797

SHEET 1 OF 1

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01	-02
1	144-142			CONNECTOR, Clr Plug, 4 socket		2	2
2	262-003			BUSHING, Telescoping, .312 ID; .427 OD		2	2
6	302-012			CLAMP, Cable		2	2



Signal System Harness Assembly
Dwg. No. 1361798-01

SIGNAL SYSTEM HARNESS ASSEMBLY

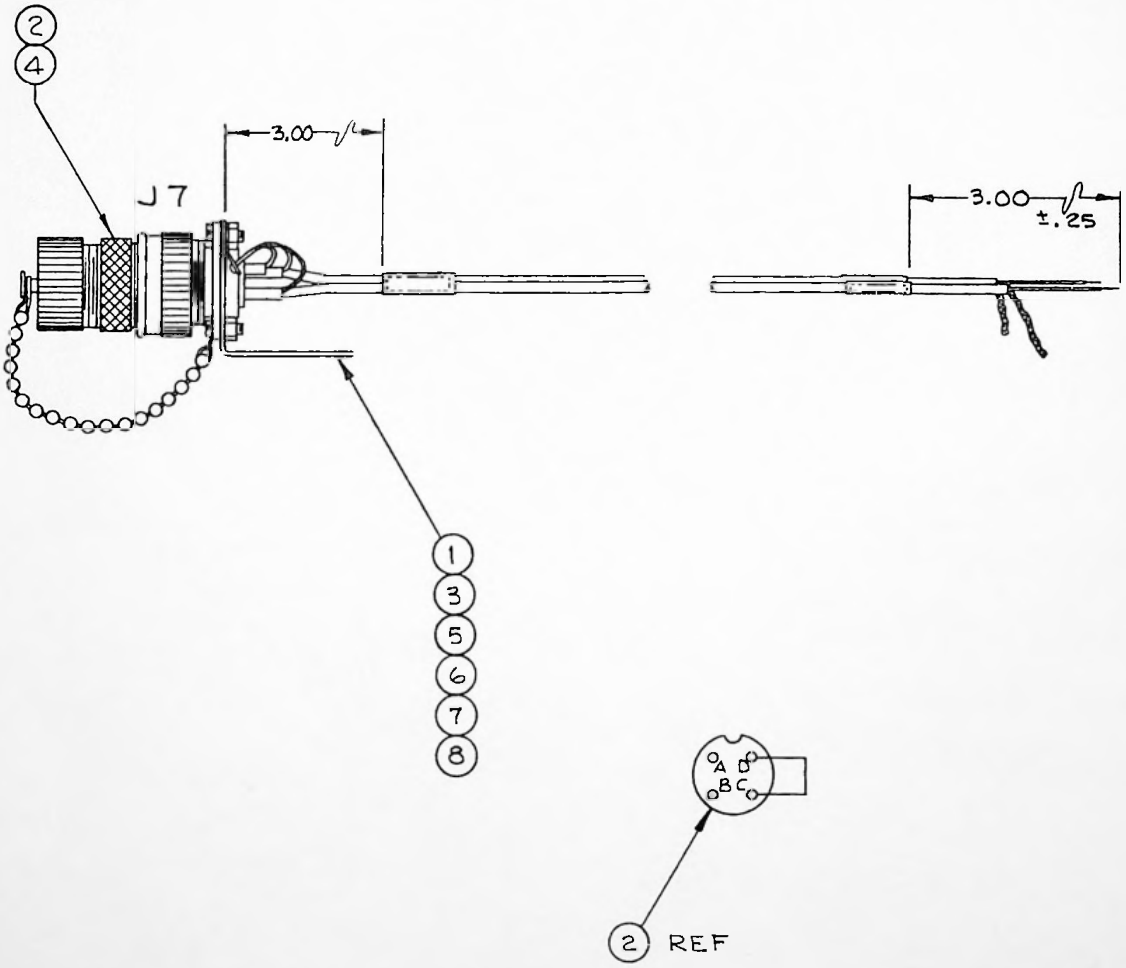
CATALOG NO. 1361798

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
1	1360104-01			BRACKET, Connector, signal system		1
2	013-689			DIODE, Silicon, CD6016		4
3	041-010			RESISTOR, Composition, 1/2W, 2000 ohms, 5%		4
4	501-110			WASHER, Flat, #4		2
5	502-024			WASHER, Lock, internal tooth #4		2
14	146-173			CONNECTOR, Rectangular, receptacle, 26 socket		1

WIRE LEAD LIST	TITLE SIGNAL SYSTEM HARNESS ASSEMBLY	LM- 1341798 SHEET 2 OF 2	ISSUE

ITEM NO	AMPEX PART NO	WIRE AWG -SEE NOTE	CONDUCTOR	FROM STA	FROM COMP	FROM TERM	TO STA	TO COMP	TO TERM	REMARKS	QUANTITY PER VERSION
		COAX	CENTER		J23	A		-		15.00" LONG	
			SHIELD		J23	C		-		TO J008 TERMINAL 11	
		COAX	CENTER		J23	K		-		12.00" LONG	
			SHIELD		J23	M		-		TO J012 TERMINAL 17	
					J23	N		CR6	CATH	ANODE TO J015 TERMINAL 4	
					J23	N		R31		TO J23 TERMINAL R	
					J23	T		CR7	CATH	ANODE TO J015 TERMINAL 5	
					J23	T		R32		TO J23 TERMINAL V	
					J23	X		CR8	CATH	ANODE TO J015 TERMINAL 6	
					J23	X		R33		TO J23 TERMINAL Z	
					J23	BB		CR9	CATH	ANODE TO J015 TERMINAL 7	
					J23	BB		R34		TO J23 TERMINAL DD	
		16 GA (BARE)			J23	12		J23	V		
		16 GA (BARE)			J23	V		J23	Z		
		16 GA (BARE)			J23	Z		J23	DD		
		24 GA (RED)			J23	Y		-		5.00" LONG TO J016 TERMINAL 19	
		24 GA (WHT/BLK)			J23	CC		-		5.00" LONG TO J016 TERMINAL 20	
		24 GA (BLK)			J23	DD		-		2.00" LONG (GRD)	



Harness Assembly
Dwg. No. 1360415-01A

HARNESS ASSEMBLY

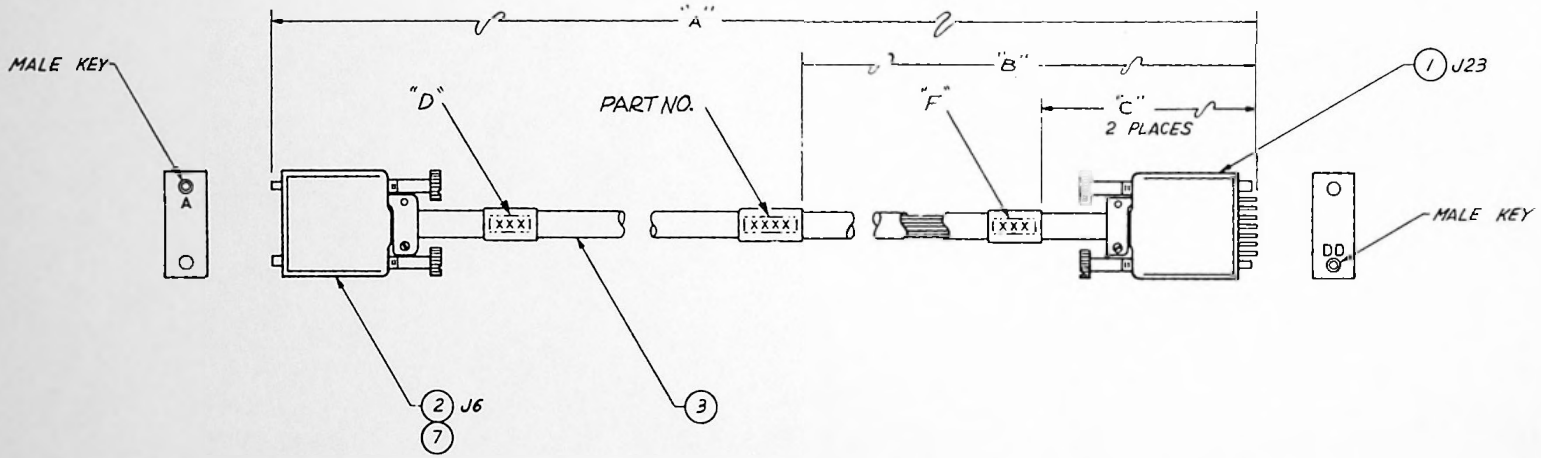
CATALOG NO. 1360415

SHEET 1 OF 1

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
1	1213536-03			BRACKET, Connector, adapter		1
2	144-142			CONNECTOR, Plug, female		1
3	147-146			CONNECTOR, Receptacle, male		1
4	162-006			CAP, Cover, connector		1
5	172-004			LUG, Solder, #4		1
6	471-061			SCREW, Pan Head, #4-40 x 5/16 long		4
7	492-019			NUT, Hex, #4-40		1
8	496-004			NUT, Kep, #4-40		3

VERSION TABULATION					
VERSION	DIM "A"	DIM "B"	DIM "C"	DES. "D"	DES. "F"
-01	38.00	19.00	3.50 ± .25	CONT PNL J6	SIG SYS J23
-02	138.00	69.00	3.50 ± .25	VEL COMP J6	CONT PNL J7
-03	38.00	19.00	3.50 ± .25	VEL COMP J6	SIG SYS J23



Head Switching Cable Assembly
Dwg. No. 1361793C

AMPEX

HEAD SWITCHING CABLE ASSEMBLY

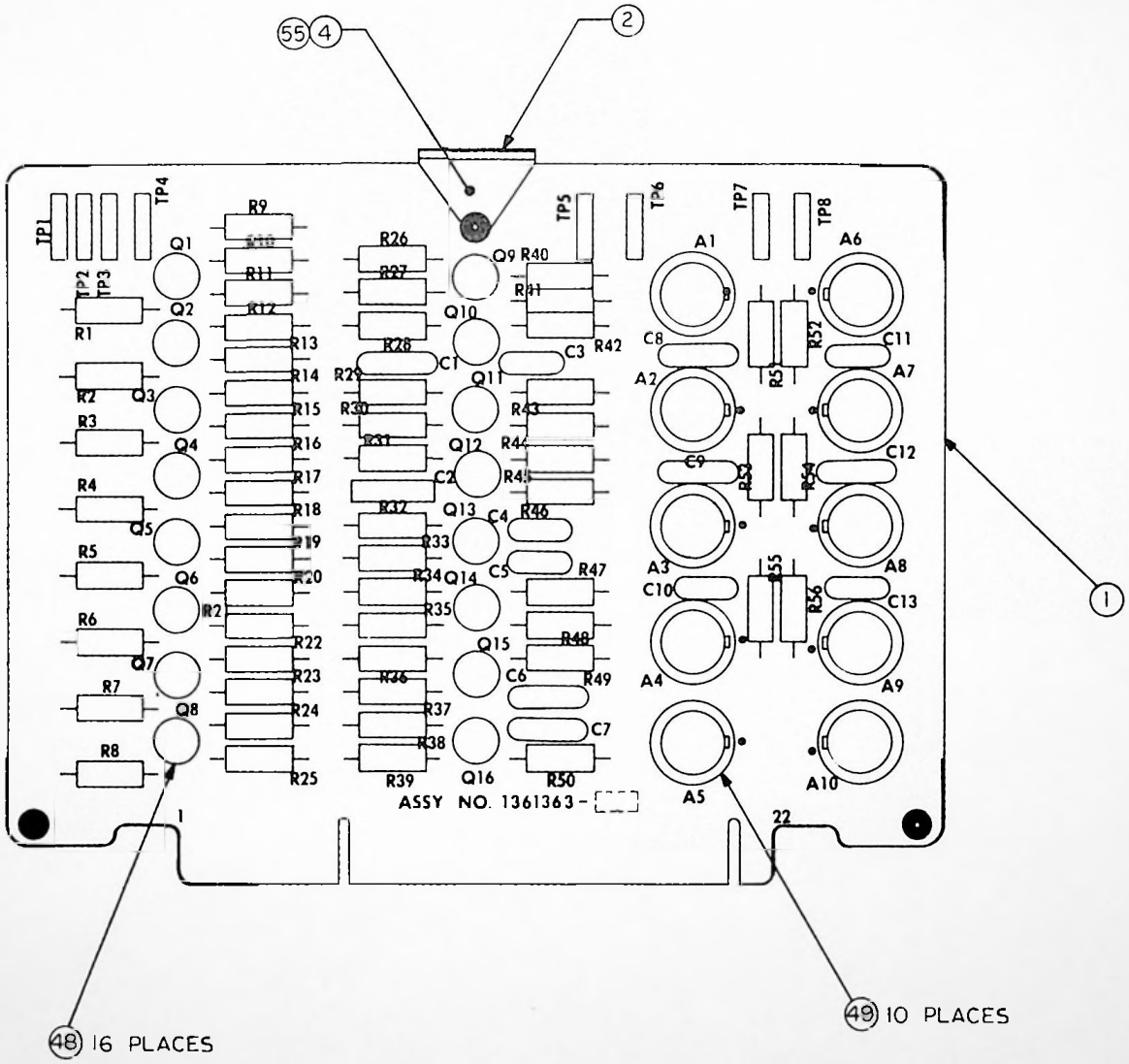
CATALOG NO. 1361793

SHEET 1 OF 2

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01	-02	-03
1	145-208		J23	CONNECTOR, Plug, 26 pin		1	1	1
2	143-312		J6	CONNECTOR, Receptacle, 26 pin		1	1	1
7	171-119			FERRULE, Electrical Connector		12	12	12

WIRE LEAD LIST	TITLE HEAD SWITCHING CABLE ASSEMBLY								LM- 1361793 SHEET 2 OF 2				ISSUE
ITEM NO	AMPEX PART NO	WIRE AWG -SEE NOTE	CONDUCTOR	FROM STA	FROM COMP	FROM TERM	TO STA	TO COMP	TO TERM	REMARKS	QUANTITY PER VERSION -01	-02	-03	
		COAX	CENTER		J6	A		J23	A		1	1	1	
			SHIELD		J6	C		J23	C		1	1	1	
		COAX	CENTER		J6	K		J23	K		1	1	1	
			SHIELD		J6	M		J23	M		1	1	1	
		COAX	CENTER		J6	N		J23	N		1	1	1	
			SHIELD		J6	R		J23	R		1	1	1	
		COAX	CENTER		J6	T		J23	T		1	1	1	
			SHIELD		J6	V		J23	V		1	1	1	
		COAX	CENTER		J6	X		J23	X		1	1	1	
			SHIELD		J6	Z		J23	Z		1	1	1	
		COAX	CENTER		J6	BB		J23	BB		1	1	1	
			SHIELD		J6	DD		J23	DD		1	1	1	
		24 GA (WHT)			J6	Y		J23	Y		1	1	1	
		24 GA (BLK)			J6	CC		J23	CC		1	1	1	



Head Decoder Printed Wiring Assembly
Dwg. No. 1361363-01

HEAD DECODER PRINTED WIRING ASSEMBLY

CATALOG NO. 1361363

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
2	1242979-06			LABEL, Identification		1
3	1385255		1385255	SCHEMATIC		REF
4	52528-01			HANDLE		1
7	014-248		Q1-8	TRANSISTOR, Silicon, CD37		8
8	014-505		Q16	TRANSISTOR, Silicon, CD445		1
9	014-506		Q9-15	TRANSISTOR, Silicon, CD446		7
11	034-162		C5	CAPACITOR, Mica, 50 pF, 500V, 5%		1
12	034-183		C10, 11, 13	CAPACITOR, Mica, 62 pF, 500V, 5%		3
13	034-328		C1, 6, 7	CAPACITOR, Mica, 100 pF, 500V, 5%		3
14	034-943		C3	CAPACITOR, Mica, 27 pF, 500V, 5%		1
15	034-951		C8, 9, 12	CAPACITOR, Mica, 200 pF, 500V, 5%		3
16	034-963		C4	CAPACITOR, Mica, 15 pF, 500V, 5%		1
17	055-159		C2	CAPACITOR, Mylar, .047 UF, 50V, 10%		1
20	041-008		R52, 55, 56	RESISTOR, Composition, 1.5K, 1/2W, 5%		3
21	041-010		R11, 15, 19, 23	RESISTOR, Composition, 2K, 1/2W, 5%		4
22	041-013		R44	RESISTOR, Composition, 4.7K, 1/2W, 5%		1
23	041-014		R28	RESISTOR, Composition, 10K, 1/2W, 5%		1
24	041-017		R29	RESISTOR, Composition, 33K, 1/2W, 5%		1
25	041-239		R36, 39, 41, 42, 49	RESISTOR, Composition, 2.2K, 1/2W, 5%		5
26	041-245		R12, 16, 20, 24, 25, 31, 33, 35	RESISTOR, Composition, 1K, 1/2W, 5%		8
27	041-254		R43	RESISTOR, Composition, 15K, 1/2W, 5%		1
28	041-278		R2, 4, 6, 8, 40	RESISTOR, Composition, 2.7K, 1/2W, 5%		5
29	041-309		R26, 27	RESISTOR, Composition, 8.2K, 1/2W, 5%		2
30	041-329		R45, 46, 58	RESISTOR, Composition, 330 ohms, 1/2W, 5%		3
31	041-330		R34, 47	RESISTOR, Composition, 6.8K, 1/2W, 5%		2
32	041-343		R1, 3, 5, 7	RESISTOR, Composition, 680 ohms, 1/2W, 5%		4
33	041-357		R30, 37	RESISTOR, Composition, 5.6K, 1/2W, 5%		2
34	041-420		R32	RESISTOR, Composition, 12K, 1/2W, 5%		1
35	041-455		R51, 53, 54	RESISTOR, Composition, 6.2K, 1/2W, 5%		3
36	041-456		R9, 13, 17, 21, 38	RESISTOR, Composition, 36K, 1/2W, 5%		5
37	041-950		R10, 14, 18, 22, 50	RESISTOR, Composition, 16K, 1/2W, 5%		5
38	148-027		TP2	CONNECTOR, Tip Jack, red		1
39	148-029		TP5	CONNECTOR, Tip Jack, green		1

HEAD DECODER PRINTED WIRING ASSEMBLY

CATALOG NO. 1361363

NHA 1805184

ITEM NO.	AMPEX PART NO.	VENDOR OR MIL. NO.	SCHEMATIC REFERENCE	PART DESCRIPTION	MFR CODE	QUANTITY REQUIRED PER VERSION -01
40	148-030		TP6	CONNECTOR, Tip Jack, blue		1
41	148-031		TP4	CONNECTOR, Tip Jack, yellow		1
42	148-987		TP7	CONNECTOR, Tip Jack, purple		1
43	148-988		TP8	CONNECTOR, Tip Jack, gray		1
44	148-991		TP3	CONNECTOR, Tip Jack, orange		1
45	148-993		TP1	CONNECTOR, Tip Jack, brown		1
48	280-130			SPACER, Transistor		16
49	280-173			SPACER, Internal Cricuit		10
51	586-021		A1, 2, 4-6, 8, 10	CIRCUIT, Integrated Logic		7
52	586-022		A3, 7, 9	CIRCUIT, Integrated Logic		3