Errata

Title & Document Type: 5371A Frequency & Time Interval Analyzer Service Manual, Volume 1

Manual Part Number: 05371-90018

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HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

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Agilent no longer sells or supports this product. You will find any other available product information on the Agilent Test & Measurement website:

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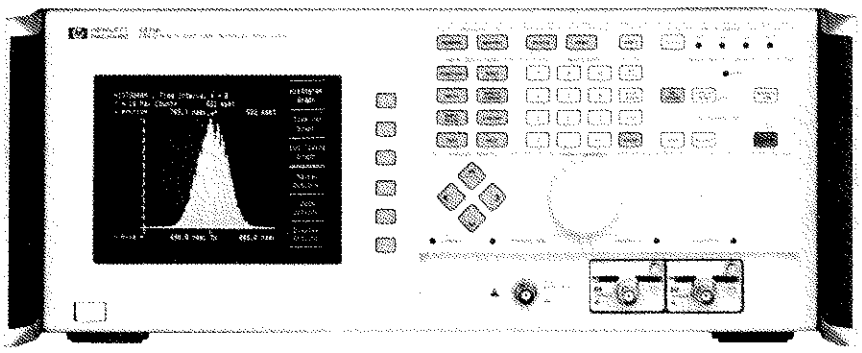
Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.

Agilent Technologies

HEWLETT-PACKARD

Service Manual
Volume 1

HP 5371A
Frequency and Time Interval Analyzer



SERVICE MANUAL

Volume 1

HP 5371A
Frequency and Time Interval Analyzer

MANUAL APPLICABILITY

This manual applies directly to an HP 5371A having the serial number prefix listed below. If this number does not match your instrument, refer to the "Manual Updating Changes" included with this manual.

For additional important information about serial numbers, see INSTRUMENTS COVERED BY THIS MANUAL in the Introduction.

SERIAL NUMBER

Serial Number Prefix: 2842

Edition 2
E0289

Manual Part Number 05371-90018
Microfiche Part Number 05371-90019

Printed FEBRUARY 1989

HEWLETT PACKARD

CERTIFICATION

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology (formerly National Bureau of Standards), to the extent allowed by that organization's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCLUSIVE REMEDIES

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HP SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

ASSISTANCE

Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.

SAFETY CONSIDERATIONS

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation.

This product is a Safety Class I instrument (provided with a protective earth terminal).

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage and the correct fuse is installed. Refer to Operating Manual, Appendix B, INSTALLATION.

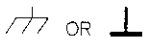
SAFETY EARTH GROUND

An uninterruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.

SAFETY SYMBOLS

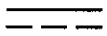
Instruction manual symbol; the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual.

Indicates hazardous voltages.



Indicates terminal is connected to chassis when such connection is not apparent.

Alternating current.



Direct current.

The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a **CAUTION** sign until the indicated conditions are fully understood and met.

SAFETY INFORMATION

WARNING

Any interruption of the protective grounding conductor (inside or outside the instrument) or disconnecting the protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two conductor outlet is not sufficient protection.)

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an autotransformer (for voltage reduction) make sure the common terminal is connected to the earthed pole terminal (neutral) of the power source.

Instructions for adjustments while covers are removed and for servicing are for use by service-trained personnel only. To avoid dangerous electric shock, do not perform such adjustments or servicing unless qualified to do so.

For continued protection against fire, replace the line fuse(s) only with 250V fuse(s) of the same current rating and type (for example, normal blow, time delay). Do not use repaired fuses or short circuited fuseholders.

When measuring power line signals, be extremely careful and always use a step-down isolation transformer whose output voltage is compatible with the input measurement capabilities of this product. This product's front and rear panels are typically at earth ground, so **NEVER TRY TO MEASURE AC POWER LINE SIGNALS WITHOUT AN ISOLATION TRANSFORMER.**

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SECTION 1
GENERAL INFORMATION

INTRODUCTION

This manual provides information necessary for testing, adjusting, and servicing the HP 5371A Frequency and Time Interval Analyzer.

SERVICE MANUAL ORGANIZATION AND CONTENTS

The HP 5371A Service Manual consists of two volumes organized as follows:

Volume I:

SECTION 1 — GENERAL INFORMATION. Describes how the service manual is organized and how to locate information, where to find selected information in the Operating Manual, a brief description of the instrument, specifications, instruments covered by the service manual, options and accessories available, service equipment available, and a list of recommended test equipment.

SECTION 2 — PERFORMANCE TESTS. Provides abbreviated procedures for operational verification that gives the operator a high degree of confidence that the HP 5371A is operating properly. Also provides performance test procedures that test the electrical performance standards of the instrument, using specifications listed in Section 1 of this manual.

SECTION 3 — ADJUSTMENTS. Provides the procedures required to properly maintain the instrument operating characteristics within specifications.

SECTION 4 — REPLACEABLE PARTS. Provides ordering information for all replaceable parts and assemblies within the instrument.

SECTION 5 — MANUAL CHANGES: provides information necessary to adapt this service manual to older versions of the HP 5371A for which the contents of this manual do not apply.

SECTION 6 — THEORY OF OPERATION. Provides an overall description of the instrument operation. An overall block diagram of the instrument is also provided.

Volume II:

SECTION 7 — SERVICE. This section contains the information required to service the HP 5371A. Service information includes safety information, diagnostics, component-level theory of operation, board block diagrams, troubleshooting procedures, test waveforms, component locators, schematic diagrams, cabling and assembly locations, disassembly and reassembly procedures, and signal descriptions and destinations.

APPENDIX A — ARMING. Provides descriptions for the various functions, arming modes, and channels used.

APPENDIX B — DEFAULT MEASUREMENT SETUPS. Provides default measurement conditions common to all types of measurements, and default setup values unique to each type of measurement.

APPENDIX C — LOGIC SYMBOLOGY. Explanations of the IEC logic conventions used in the schematics of this manual.

INSTRUMENT DESCRIPTION

The HP 5371A Frequency and Time Interval Analyzer is a precision frequency and time interval measuring instrument that uses a new counting technique called "continuous measurement". This new counting technique provides contiguous frequency and time interval measurements with a wide range of arming and triggering features. Time-sampling of frequency and time interval measurements up to 10 MHz eliminating measurement "dead time" is attainable. Trigger events are time-stamped and stored for post-processing by a 68000 microprocessor. A special integrated circuit, called a Sequencer, controls the arming of three 32-bit count chains, each operating simultaneously and using two 16-bit ZDT (Zero-Dead-Time) counters. A new interpolation technique resolves measurements to 200 ps LSD. High-speed memory provides built-in statistical analysis capability. A front-panel CRT display allows presentation of measurement data and user-friendly interface.

The HP 5371A has two independent measurement channels, A and B, and an external arming input. Arming can occur on any of these three inputs and can be specified by time, events, signal edge, cycle, or parity.

In addition to making frequency (and period) and time interval measurements, the HP 5371A can make the following measurements:

- Positive and Negative Pulse Width Measurements,
- Rise and Fall Time Measurements,
- Totalize Measurements,
- Phase Measurements,
- Peak Amplitude Measurements, and
- Simultaneous Dual-channel Frequency Measurements.

The HP 5371A can analyze measurement data to produce histograms, time variance graphs, limit tests, Allan Variance, and more. Additional features include (1) HP-IB compatibility with enhanced control language, (2) CRT screen printout capability, (3) diagnostic capability accessible via the front panel, (4) statistics and math capability, (5) save and recall of instrument setups, and (6) graphics capability.

SPECIFICATIONS

The specifications for the HP 5371A are listed in *Table 1-1*. These are the performance standards, or limits against which the HP 5371A may be tested including typical characteristics as additional information for the user.

SAFETY CONSIDERATIONS

The HP 5371A is a Safety Class I instrument provided with a protective earth terminal. This instrument is designed and tested to international safety standards. Safety information pertinent to the operation and servicing of this instrument is included in Section 6 of this manual.

Safety Symbols

The safety symbols used on equipment and in manuals are shown in *Table 7-1* of this manual.

HOW TO LOCATE INFORMATION

Service Manual

Two methods are used to assist in locating information: (1) a Table of Contents preceding Section 1, and (2) a tab system that divides the manual into sections and subsections.

Operating Manual

There may be occasions when service personnel may need access may need access to information contained in the Operating Manual. Due to limits placed on manual page count, these sections cannot be duplicated in the service manual. The sections of the Operating Manual followed by a brief description follows.

Section 1	Provides a "hands-on" tutorial that helps the user become more familiar with most of the HP 5371A features.
Sections 2,3, & 4	Detailed information about how the HP 5371A makes specific measurements.
Section 5	Explanation of arming modes.
Sections 6 & 17	Summary of front- and rear-panel operating information.
Sections 7 to 17	Operating information organized by front panel key label.

INSTRUMENT AND MANUAL IDENTIFICATION

The instrument serial number is located on the rear panel of the instrument. The serial number is in the form: XXXXAYYYYY. The first four digits (XXXX) and the letter A comprise the serial number prefix. The last five digits (YYYYY) are the suffix. The prefix (XXXXA) is the same for all identical instruments; it changes only when a change is made to the instrument. The suffix (YYYYY), however, is assigned sequentially and differs from instrument to instrument. The contents of this manual apply to instruments with the serial number prefix(es) listed under SERIAL NUMBER on the title page.

An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different than that described in this manual. The manual for this newer instrument is accompanied by "MANUAL UPDATING CHANGES" supplement. This supplement contains information that explains how to adapt the manual to the newer instruments.

In addition to change information, the supplement may contain information for correcting errors in the manual. To keep this manual current and as possible, Hewlett-Packard recommends that you periodically request the latest MANUAL UPDATING CHANGES. The supplement for this manual is identified with the manual print date and part number, both of which appear on the manual title page. Complimentary copies of the supplement are available from Hewlett-Packard. For information concerning a serial number prefix that is not listed on the title page or in the MANUAL UPDATING CHANGES supplement, contact your nearest Hewlett-Packard Sales and Support Office.

Listed on the title page is the part number for a microfiche version of the Service Manual. This number can be used to order 100 x 150 mm (4 x 6 inch) microfilm transparencies of the manual. Each microfiche contains up to 96 photo-duplicates of the manual pages.

OPTIONS

The following options are available with the HP5371A.

Rear Panel Inputs (Option 060)

Option 060 has 50Ω BNC inputs for Channel A and B, and a 1 MΩ EXTERNAL ARM input BNC available on the instrument rear panel. Front-panel input pods cannot be used when Option 060 is installed. Channel A and B input performance is equivalent to front panel performance for Option 060 configuration. External Arm performance for the Option 060 configuration is listed in Rear Panel Specifications, SPECIFICATIONS, located earlier in this section.

Rack Mount Adapter Kit - With Handles Removed (Option 908)

Option 908 Rack Mounting Kit is available, at additional cost, when ordered at the same time as the instrument. If ordered separately, the Rack Mounting Kit may be ordered using HP Part Number 5061-9678. The kit consists of two flanges and mounting hardware.

Additional Manual (Option 910)

Option 910 adds a second copy of the Operating and Programming Manual (05371-90003) at additional cost when ordered at the same time as the HP 5371A.

Rack Mount Flange Kit - With Handles Attached (Option 913)

Option 913 Rack Mounting Kit is available, at additional cost, when ordered at the same time as the instrument. If ordered separately, the Rack Mounting Kit may be ordered using HP Part Number 5061-9772. The kit consists of two flanges and mounting hardware. This option supplies two rack flanges and mounting hardware to instruments already equipped with front handles.

Extended Warranty Support (Option W30)

Option W30 provides two additional years of return-to-HP hardware-service support. Option W30 is available only at the time of the instrument's purchase. Service contracts are available from Hewlett-Packard for instruments which did not include Option W30 at the time of purchase. For more information, contact your nearest Hewlett-Packard Sales and Support office.

ACCESSORIES SUPPLIED

The HP 5371A is supplied with a power cord (HP Part Number 8120-1378).

ACCESSORIES AVAILABLE

The HP 54002A 50Ω BNC Input Pod is standard and shipped with the HP 5371A. This pod is used where measurements require terminated lines. Pod alternatives to the HP 54002A and additional accessories are listed below.

HP 54001A 1-GHz Miniature Active Probe Pod

This pod is useful when measuring densely-packed, high-speed logic circuits.

HP 54003A 1-MOHM Probe Pod

This pod is useful when circuits being measured are sensitive to resistive loading. The 54003A is compatible with oscilloscope probes.

HP 54300A Probe Multiplexer

The HP 54300A is a programmable, dual eight-to-one probe multiplexer designed to expand the input capability of instrumentation with 50Ω capabilities.

HP J06-59992A Time Interval Calibrator

The HP J06-59992A Time Interval Calibrator can improve the accuracy of measurements made with the HP 5371A by providing the means to measure and remove systematic uncertainties (such as differential channel delay, long-term drift or timebase oscillator aging, and trigger level timing error) from measurement data by subtracting the measured bias.

Rack Slide-Mount Kit (HP Part Number 1494-0059)

WARNING

THE HP 5371A WEIGHS 24.5 KG (54 LBS). CARE MUST BE TAKEN WHEN LIFTING THE INSTRUMENT TO AVOID PERSONAL INJURY. USE EQUIPMENT SLIDES WHEN RACK MOUNTING.

Installation of the Rack Slide-Mount Kit reduces the need to lift the HP 5371A when rack mounting the instrument.

SERVICE EQUIPMENT AVAILABLE

The HP 5371A Support Service Kit, HP Part Number 05371-67001, contains extender boards and special cables necessary for performing troubleshooting and adjustment procedures. The extender boards and cables allow the HP5371A assemblies to be extended from their A12 Motherboard plug-in connectors for monitoring with appropriate test equipment.

RECOMMENDED TEST EQUIPMENT

The test equipment listed in *Table 1-2* is recommended for use during performance tests, adjustments, and troubleshooting. Substitute test equipment may be used if it meets or exceeds the required characteristics listed in the table.

INPUT SPECIFICATIONS

Channel A and B:

All frequencies refer to sinusoidal signals, except where noted.

INPUT PODS

The following specifications refer to pods installed in an HP 5371A system.

The following specifications refer to an HP 5371A with HP 54002A pods installed.

	HP 54002A	HP 54001A	HP 54003A with 10:1 probe	HP 54003A without 10:1 probe
Coupling	dc	dc	dc	dc
Input Capacitance (NOMINAL)	N/A	2 pf	8 pf	10 pf
Input Resistance (NOMINAL)	50Ω	10 kΩ	1 MΩ	1 MΩ
Bandwidth (–3dB)	dc to 500 MHz	dc to 500 MHz	dc to 300 MHz	dc to 300 MHz
Maximum Input Voltage X 1: X 2.5:	 ±2V ±5V	 ±20V N/A	 ±20V N/A	 ±2V N/A

RANGE:

dc coupled to 500 MHz.

SENSITIVITY:

Independent of SEPARATE or COMMON Input Mode selection.

15 mV rms sine wave (45 mV_{pk-pk}).

45 mV_{pk-pk} at a minimum pulse width of 1 ns.

MINIMUM PULSE WIDTH:

For all measurement modes except Holdoff Arming: 1 ns (at a minimum amplitude of 45 mV_{pk-pk}).

Holdoff Arming modes: 1.5 ns (at a minimum amplitude of 45 mV_{pk-pk}).

ATTENUATOR:

X1 or X2.5, selectable, for 50Ω termination to ground (HP 54002A Input pod only).

X1 only for 50Ω termination to –2 Vdc (NOMINAL), or for HP 54001A and HP 54003A Input pods.

ATTENUATOR ACCURACY:

X1: Direct connection.

X2.5: ± 5 %.

DYNAMIC RANGE:

X1: 45 mV_{pk-pk} to 2 V_{pk-pk}.

X2.5: 115 mV_{pk-pk} to 5 V_{pk-pk} NOMINAL.

SIGNAL OPERATING RANGE:

X1: –2 Vdc < dc ± ac pk < +2 Vdc.

X2.5: –5 Vdc < dc ± ac pk < +5 Vdc NOMINAL.

⚠ **DAMAGE LEVEL:**

X1: ± 2.5 V (dc ± ac pk).

X2.5: ± 5.5 V (dc ± ac pk).

Input Triggering Characteristics

	Manual Triggering	Auto Triggering (Single or Repetitive)
Voltage Range: X1: X2.5:	 –2 Vdc to +2 Vdc –5 Vdc to +5 Vdc	 –2 Vdc to +2 Vdc –5 Vdc to +5 Vdc
Frequency Range: :	dc to 500 MHz (HP 54001A, HP 54002A) dc to 300 MHz (HP 54003A)	1 kHz to 200 MHz*
Resolution: X1 X2.5:	 2 mV NOMINAL 5 mV NOMINAL	1% steps (2 mV minimum) 1% steps (5 mV minimum)
Accuracy:	20 mV ± 1% of setting	±20% of pk-pk amplitude (200 mV_{pk-pk} minimum)

* For input frequencies greater than 200 MHz, auto triggering modes are functional, but accuracy specifications are not guaranteed.

Auto trigger modes require a repetitive input signal and are available for input channels A and B.

For input frequencies greater than 200 MHz, auto trigger modes are functional, but accuracy specifications are not guaranteed.

SINGLE AUTO TRIGGER MODE:

The HP 5371A determines voltage trigger levels automatically at the beginning of the first block of measurements. These trigger levels are maintained for subsequent blocks in the measurement.

REPETITIVE AUTO TRIGGER MODE:

The HP 5371A determines voltage trigger levels at the beginning of each measurement block.

AUTO TRIGGER ACQUISITION TIME:

100 msec (NOMINAL) per channel, 200 msec (NOMINAL) for two-channel measurements. Auto triggering will only be performed for channels which are currently selected as measurement sources on the FUNCTION menu.

TRIGGERING INDICATOR:

An LED for each respective input: A, B, and External Arm, will flash when a signal is triggering the input circuitry. The LED will not flash if the signal does not cross the trigger threshold.

TRIGGER LEVEL DRIFT:

Less than ± 10 mV (0 – 40°C).

INPUT MODE SELECTION:

Separate: User-selectable and programmable. Each input channel A and B is connected directly to its respective input circuitry.

Common A: User-selectable and programmable. Input channel A signals are also routed to the input channel B count circuitry. Input channel B is terminated per the INPUT menu selection. Termination characteristics are maintained to the device under test, while signal amplitude is maintained to both input channels.

External Arm Input:

In addition to the External Arm input, both input channels A and B may also be used as high performance arming inputs.

RANGE:

dc coupled to 100 MHz.

SENSITIVITY:

50 mV rms sine wave.

140 $mV_{pk\text{-}pk}$ at a minimum pulse width of 5 ns.

MINIMUM PULSE WIDTH:

5 ns (at a minimum amplitude of 140 $mV_{pk\text{-}pk}$).

IMPEDANCE:

1 MΩ NOMINAL, shunted by < 50 pf.

DYNAMIC RANGE:

50 $mV_{pk\text{-}pk}$ to 5 $V_{pk\text{-}pk}$.

SIGNAL OPERATING RANGE:

–5 Vdc < dc ± ac pk < + 5 Vdc.

⚠ **DAMAGE LEVEL:**

5 V rms (±15 V_{pk-pk}, dc ± peak ac).

TRIGGER LEVEL RANGE:

Adjustable from –5.00 Vdc to +5.00 Vdc in 20 mV steps.

TRIGGER LEVEL RESOLUTION:

20 mV NOMINAL.

TRIGGER LEVEL ACCURACY:

±20 mV or ± 10% of trigger level setting, whichever is greater.

MEASUREMENT MODE SPECIFICATIONS

Continuous Frequency Measurements:

The minimum continuous sample interval is 100 ns (10 MHz sample rate) for single-channel measurements, and 200 ns (5 MHz sample rate) for two-channel measurements. Sample intervals less than 100 ns are available, but measurements will not be contiguous.

The HP 5371A offers one- and two-channel measurement features for frequency. The following single-result and dual-result arithmetic combinations of frequency measurements are available for display and analysis:

Frequency A (single-result).
Frequency B (single-result).
Frequency A&B (dual-result).
Frequency A+B (single-result).
Frequency A-B (single-result).
Frequency B-A (single-result).
Frequency A/B (single-result).
Frequency B/A (single-result).

Accuracy and resolution equations apply to both input channels.

Frequency measurements are acquired simultaneously for all two-channel measurements. Measurement throughput is dictated by the lower frequency input signal.

RANGE:

Frequency A,B: 125 mHz to 500 MHz.

Frequency A&B, A+B, A–B, B–A: 250 mHz to 500 MHz.

FOR A SINGLE MEASUREMENT:

LEAST SIGNIFICANT DIGIT DISPLAYED:

$$\pm \frac{200\ \text{ps}}{\text{Sample Interval}} \times \text{Frequency}$$

RESOLUTION:

$$\pm \frac{150\ \text{ps rms} + (1.4 \times \text{Trigger Error})}{\text{Sample Interval}} \times \text{Frequency}\dagger$$

ACCURACY:

± Resolution ± (Time Base Aging × Frequency)‡

† Refer to graph 1
‡ Refer to graph 2

FOR CONTINUOUS FREQUENCY MEASUREMENTS (MEAN ESTIMATION):

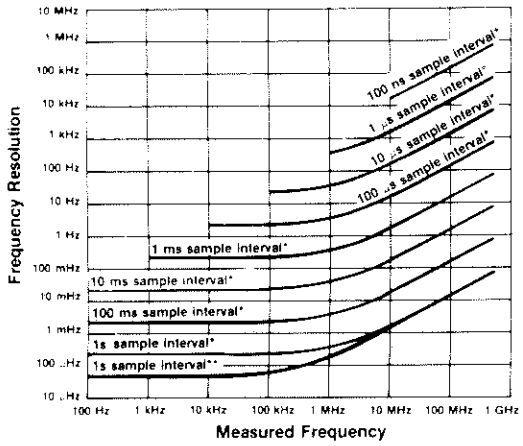
rms RESOLUTION: (for Number of Measurements per Block ≥3)

$$\frac{\sqrt{13.5} \times (150 \text{ ps rms} + 1.4 \times \text{Trigger Error})}{(\text{Number of Blocks})^{1/2} \times (\text{Number of Measurements per Block})^{3/2} \times \text{Sample Interval}} \times \text{Frequency}$$

ACCURACY:

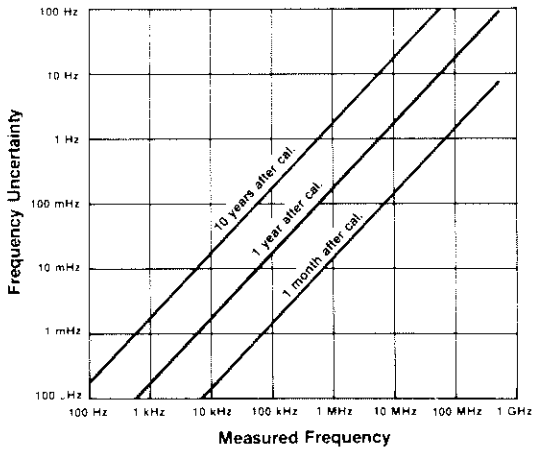
± Resolution ± (Time Base Aging × Frequency)‡

† Refer to graph 1
‡ Refer to graph 2



*1 mV rms noise, 2 Vp-p sine wave
**100 µV rms noise, 2 Vp-p sine wave

Graph 1. Noise on the input signal will add uncertainty to Frequency or Period measurement resolution. Longer sample times and averaging will reduce the effects of random noise.



Graph 2. Timebase crystal aging affects Frequency and Period measurement accuracy. You can further reduce aging uncertainty by using an atomic standard.

Continuous Period Measurements:

The HP 5371A offers one- and two-channel period measurement features. The following single-result and dual-result arithmetic combinations of period measurements are available for display and analysis:

Period A (single-result).
Period B (single-result).
Period A&B (dual-result).
Period A+B (single-result).
Period A-B (single-result).
Period B-A (single-result).
Period A/B (single-result).
Period B/A (single-result).

Accuracy and resolution equations apply to both input channels.

Period measurements are acquired simultaneously for all two-channel measurements. Throughput is dictated by the lower frequency (larger period) input signal.

RANGE:

Period A,B: 2 ns to 8.0 seconds.

Period A&B, A+B, A–B, B–A: 2 ns to 4.0 seconds.

FOR A SINGLE MEASUREMENT:

LEAST SIGNIFICANT DIGIT DISPLAYED:

$$\pm \frac{200\text{ ps}}{\text{Sample Interval}} \times \text{Period}$$

RESOLUTION:

$$\pm \frac{150\text{ ps rms} + (1.4 \times \text{Trigger Error})}{\text{Sample Interval}} \times \text{Period}$$

ACCURACY:

± Resolution ± (Time Base Aging × Period)

FOR CONTINUOUS PERIOD MEASUREMENTS (MEAN ESTIMATION):

rms RESOLUTION: (for Number of Measurements per Block ≥3)

$$\frac{\sqrt{13.5} \times (150\text{ ps rms} + 1.4 \times \text{Trigger Error})}{(\text{Number of Blocks})^{1/2} \times (\text{Number of Measurements per Block})^{3/2} \times \text{Sample Interval}} \times \text{Period}$$

ACCURACY:

± Resolution ± (Time Base Aging × Period)

Frequency or Period Ratio Measurements A/B or B/A:

The following equations apply for frequency or period A/B and B/A measurements:

RANGE:

250 mHz to 500 MHz (2 ns to 4.0 seconds).

LEAST SIGNIFICANT DIGIT DISPLAYED:

$$\pm \frac{200\text{ ps}}{\text{Sample Interval}}$$

RESOLUTION:

$$\pm \text{RATIO} \frac{150 \text{ ps rms} + (1.4 \times \text{Trigger Error})}{\text{Sample Interval}}$$

ACCURACY:

$$\pm \text{Resolution} \pm \frac{\text{Timebase Aging} \times \text{Frequency A}}{\text{Timebase Aging} \times \text{Frequency B}}$$

Totalize Measurements:

The HP 5371A offers one- and two-channel measurement features for totalize. The following single-result and dual-result arithmetic combinations of totalize measurements are available for display and analysis:

Totalize A (single-result).

Totalize B (single-result).

Totalize A&B (dual-result).

Totalize A+B (single-result).

Totalize A-B (single-result).

Totalize B-A (single-result).

Totalize A/B (single-result).

Totalize B/A (single-result).

Accuracy and resolution equations apply to both input channels.

Totalize measurements are acquired simultaneously for all two-channel measurements.

RANGE:

0 to 4×10^9 events per measurement sample, for each channel.

LEAST SIGNIFICANT DIGIT DISPLAYED:

1 count of input per measurement sample, for each channel.

RESOLUTION:

± 1 count of input per measurement sample, for each channel.

For A/B, B/A:

$$\pm \frac{(\text{Totalize Result A} \pm 1)}{(\text{Totalize Result B} \mp 1)}$$

ACCURACY:

± 1 count of input per measurement sample, for each channel.

For A/B, B/A:

$$\pm \frac{(\text{Totalize Result A} \pm 1)}{(\text{Totalize Result B} \mp 1)}$$

Time Interval Measurements:

The HP 5371A is capable of measuring consecutive time intervals up to a 10 MHz rate for period type interval measurements (Continuous Time Interval A or B), and 5 MHz for two channel measurements such as Time Interval A→B.

If data rates exceed these values, the number of events which do not have timing information are noted on the NUMERIC display in the EXPANDED results display.

The following Time Interval measurement configurations are available:

Time Interval, ±Time Interval, Continuous Time Interval A (single-result).

Time Interval, ±Time Interval, Continuous Time Interval B (single-result).

Time Interval and ± Time Interval A→B (single-result).

Time Interval and ± Time Interval B→A (single-result).

RANGE:

Time Interval: 10 ns to 8.0 seconds

Continuous Time Interval: 100 ns to 8.0 seconds

± Time Interval: – 4.0 seconds to +4.0 seconds, including 0 seconds.

LEAST SIGNIFICANT DIGIT DISPLAYED:

N = number of measurements averaged.

$$\pm \frac{200\ \text{ps}}{\sqrt{N}}$$

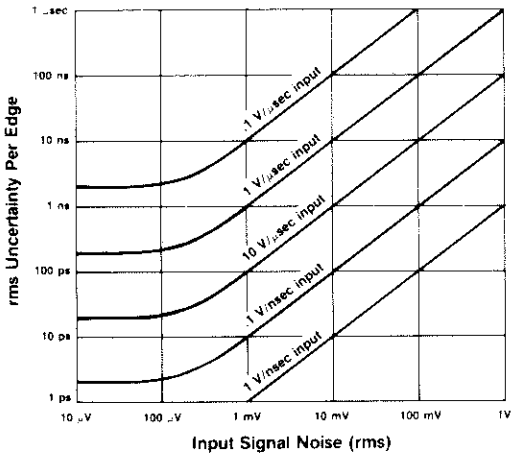
RESOLUTION:

$$\pm \frac{150\ \text{ps rms} \pm \text{Start Trigger Error}\dagger \pm \text{Stop Trigger Error}\dagger}{\sqrt{N}}$$

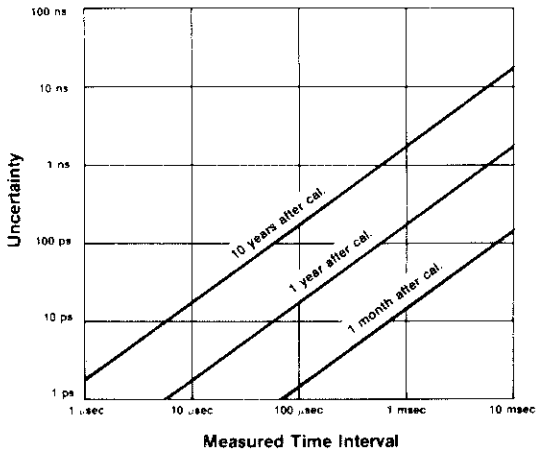
ACCURACY:

± RESOLUTION ± (Time Base Aging × Time Interval††) ± Trigger Level Timing Error‡ ± 1 ns Systematic Error*

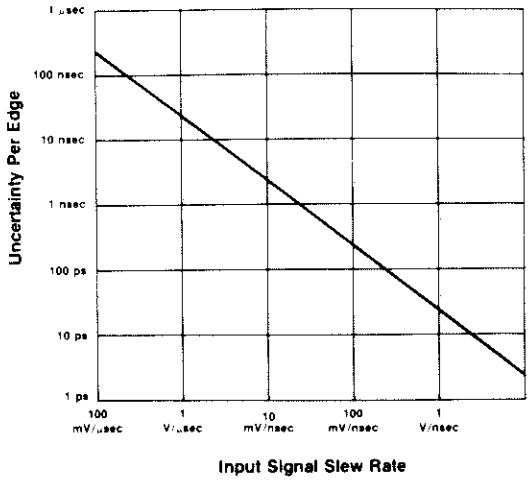
† Refer to Graph #3.
†† Refer to Graph #4.
‡ Refer to Graph #5.
* Systematic error can be reduced to less than 10 ps with the HP J06-59992A Time Interval Calibrator.



Graph 3. Noise on the input signal will add uncertainty to time interval measurements. Averaging will reduce the effects of random noise.



Graph 4. Timebase crystal aging affects time interval measurements.



Graph 5. Trigger level timing error varies with input signal slew rate. Uncertainty is associated with both start and stop edges.

Rise Time A and Fall Time A:

Common A and Repetitive Auto Trigger are automatically enabled for these measurements. Trigger points are defaulted to the 20% and 80% points of the peak-to-peak amplitude for rise time (or 80% and 20% for fall time). All trigger values are NOMINAL. Other trigger values may be selected from the INPUT menu.

Rise time and fall time measurements are two-channel, single-result measurements.

RANGE:

1 ns to 100 µs transitions (auto trigger).

4 s period slowest repetition rate (manual trigger).

MINIMUM PULSE HEIGHT (X1 Attenuation):

200 $mV_{pk\text{-}pk}$ (auto trigger).

LEAST SIGNIFICANT DIGIT DISPLAYED:

N = number of measurements averaged.

$$\pm \frac{200\ ps}{\sqrt{N}}$$

RESOLUTION:

$$\pm \frac{150\ ps\ rms \pm Start\ Trigger\ Error \pm Stop\ Trigger\ Error}{\sqrt{N}}$$

ACCURACY:

± RESOLUTION ± (Time Base Aging × Time Interval) ± Trigger Level Timing Error ± 1 ns Systematic Error

Positive and Negative Pulse Width A:

Common A and Repetitive Auto Trigger are automatically enabled for these measurements. Trigger points are defaulted to the 50% (NOMINAL) point of the peak-to-peak amplitude. Trigger levels can then be varied on the INPUT menu if desired.

Positive and negative pulse width measurements are two-channel, single-result measurements.

RANGE:

1 ns to 1 ms pulse width (auto trigger).

4 s period slowest repetition rate (manual trigger).

MINIMUM PULSE HEIGHT (X1 Attenuation):

200 $mV_{pk\text{-}pk}$ (auto trigger).

LEAST SIGNIFICANT DIGIT DISPLAYED:

N = number of measurements averaged.

$$\pm \frac{200\ ps}{\sqrt{N}}$$

RESOLUTION:

$$\pm \frac{150\ ps\ rms \pm Start\ Trigger\ Error \pm Stop\ Trigger\ Error}{\sqrt{N}}$$

ACCURACY:

± RESOLUTION ± (Time Base Aging × Time Interval) ± Trigger Level Timing Error ± 1 ns Systematic Error

Duty Cycle A:

Common A and Repetitive Auto Trigger are automatically enabled for these measurements. Trigger points are defaulted to the 50% (NOMINAL) point of the peak-to-peak amplitude. Trigger levels can then be varied on the INPUT menu if desired.

Duty cycle A consists of simultaneous positive pulse width and period measurements on input channel A. Duty cycle A measurements are made continuously, or consecutively to a maximum rate of 5 MHz.

Duty cycle A is a two-channel, single-result measurement.

RANGE:

0% to 100% (provided pulse width is > 1 ns, and signal period is:
< 1 ms (auto trigger)
< 4 s (manual trigger)

MINIMUM PULSE HEIGHT (X1 Attenuation):

200 $mV_{pk\text{-}pk}$ (auto trigger).

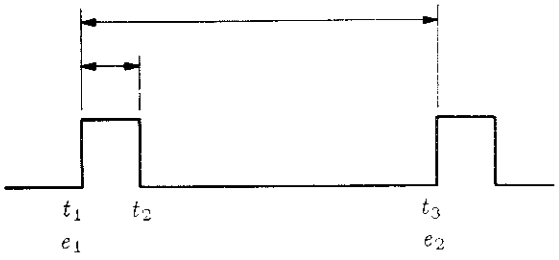
LEAST SIGNIFICANT DIGIT DISPLAYED:

$$\pm \frac{200\ ps}{Period} \times 100\%$$

RESOLUTION:

$$\pm \text{DUTY CYCLE} \times \left(150\ ps\ rms \pm (1.4 \times \text{Trigger Error})\right) \times \sqrt{\frac{1}{(t_2 - t_1)^2} + \frac{1}{(t_3 - t_1)^2}}$$

where t_1, t_2, and t_3 are time "samples", and e_1 and e_2 are event "samples".



$$\text{Duty Cycle} = \frac{(t_2 - t_1)}{(t_3 - t_1)} \times (e_2 - e_1) \times 100\%$$

ACCURACY:

$$\pm \text{Resolution} \pm \left(\frac{\text{TLTE} \pm 1\ ns}{\text{Period}}\right) \times 100\%$$

Note: TLTE = Trigger Level Timing Error

Phase A-relative-to-B, Phase B-relative-to-A:

Repetitive Auto Trigger is automatically enabled for this measurement. Trigger points are defaulted to the 50% (NOMINAL) point of the peak-to-peak amplitude for both input channels A and B. Trigger levels can then be varied on the INPUT menu if desired.

Phase measurements are made continuously, or back-to-back, up to a rate of 5 MHz. Phase measurements are two-channel, single-result measurements.

RANGE:

Phase deviations can be measured in excess of ± 360°. Results are not adjusted modulo 360°, therefore phase shifts greater than 360° will be measured and displayed. The input signal's period must be less than 4 seconds (minimum frequency 250 mHz).

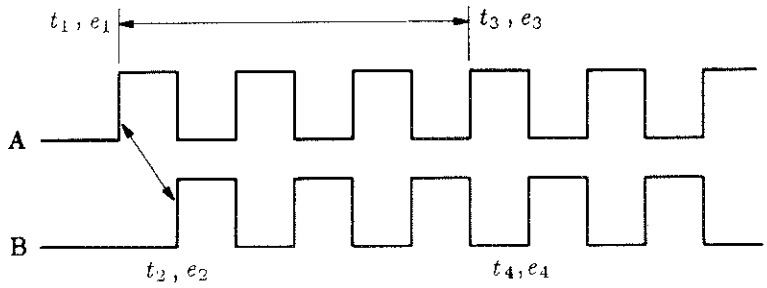
LEAST SIGNIFICANT DIGIT DISPLAYED:

$$\pm 200 \frac{\text{ps}}{\text{Period}} \times 360°$$

RESOLUTION: A relative to B (B relative to A)

$$\pm \text{PHASE} \times \left(150 \text{ ps rms} \pm (1.4 \times \text{Trigger Error})\right) \times \sqrt{\frac{1}{(t_2 - t_1)^2} + \frac{1}{(t_3 - t_1)^2}}$$

where t_1, t_2, and t_3 are time "samples" and e_1, e_2, and e_3 are event "samples".



Phase B relative to A

$$\text{Phase} = \left[\frac{(t_2 - t_1)}{(t_3 - t_1)} \times (e_3 - e_1) + \left((e_3 - e_1) - (e_4 - e_2)\right)\right] \times 360°$$

ACCURACY: (A relative to B) (B relative to A)

$$\pm \text{Resolution} \pm \left(\frac{\text{TLTE} \pm 1 \text{ ns}}{\text{Period}}\right) \times 360°$$

Peak Amplitudes A,B:

FREQUENCY RANGE:

1 kHz to 200 MHz.

AMPLITUDE RANGE:

200 $mV_{pk\text{-}pk}$ to 2 $V_{pk\text{-}pk}$ (X1 Attenuation).

RESOLUTION:

X1: 2 mV NOMINAL.

X2.5: 5 mV NOMINAL.

ACCURACY:

± 20% of peak-to-peak amplitude, 1 kHz to 200 MHz.

Note: The peak amplitude measurement mode is operational for frequencies between 200 MHz and 500 MHz, but accuracy is not guaranteed.

ARMING, GATING AND "TRIGGERING" CHARACTERISTICS

The HP 5371A features extensive arming and triggering capabilities. These capabilities allow you to control measurements in the following ways:

external edge

specified time holdoff or gate

specified event holdoff or gate

specified number of cycles of the input or the internal time base

parity

manual

Input channels A, B or External Arm may be used to arm the HP 5371A. Input channels A and B offer higher performance (500 MHz bandwidth) versus the External Arm channel (100 MHz).

Time or event delays are relative to a specified edge on any of the three input channels.

For certain arming modes, a 2 ns resolution time holdoff or gate time is available. This high resolution time sampling mode is called "TIME". For other time sampling modes, a lower resolution mode is used. This type of time sampling is termed "INTERVAL". INTERVAL sampling can be used for continuous measurements, while the 2 ns resolution TIME sampling is only available for non-continuous measurements.

AUTOMATIC Arming and Sampling:

The particular hardware configuration for this arming mode is defaulted to the fastest mode possible for the particular function. Each measurement begins as soon as the HP 5371A internal processor has configured the measurement.

EDGE Holdoff and Sampling:

Holdoff and sampling can be armed or "triggered" with a signal edge on input channels A , B, or External Arm. The slope of this edge is specified on the FUNCTION menu, while the trigger voltage is specified on the INPUT menu.

EDGE ARMING SETUP TIME:

30 ns TYPICAL.

EVENT Arming and Gating

Event holdoffs and gating are counted on the Input A or Input B channel. All event holdoffs and gates are referenced to an input signal edge on Channel A, B, or External Arm.

RANGE:

0 to 4 $\times 10^9$. If 0 is specified, the arming defaults to the edge arming mode.

RESOLUTION:

± 1 count of input signal.

EVENT ARMING SETUP TIME:

Upon the completion of the event holdoff, a setup time of < 25 ns is required before the measurement is armed.

TIME Arming and Gating:

The Time holdoff is referenced to an input signal edge on input channels A, B, or External Arm.

RANGE:

2 ns to 8.0 seconds.

RESOLUTION:

2 ns.

ACCURACY:

± 2 ns + (systematic uncertainty <25 ns)

TIME ARMING SETUP TIME:

Upon the completion of the time holdoff, a setup time of < 25 ns is required before the measurement becomes armed.

INTERVAL Sampling:

RANGE:

600 ns to 8.0 seconds.

RESOLUTION:

600 ns to 10 ms : 200 ns

10 ms to 100 ms : 2 µs

100 ms to 1 second : 20 µs

1 second to 8.0 second : 200 µs

Note that this refers to the "settability" of the sample interval. Actual measurement intervals are displayed with 200 ps LSD. In addition, the HP 5371A uses a reciprocal counting technique which synchronizes measurements to the input signal. Therefore, actual measurement gates will vary depending on the relative synchronization of the input signal.

SETUP DELAY:

The first INTERVAL will begin < 800 ns after the HP 5371A is armed.

CYCLE Sampling:

The CYCLE sampling mode uses prescaled counts of an input signal on channel A or B, or the internal 500 MHz timebase to arm measurement samples. CYCLE sampling on an input channel offers essentially a continuous EVENT sampling mode, while using the CYCLE mode with the 500 MHz timebase offers a high precision continuous time sampling mode. Each prescale value has a minimum specified input frequency at which it can be used. The available prescale ratios and the associated minimum operating frequencies are listed below:

Cycles	*Minimum Cycle Input Frequency*
2^{28} (268,435,456)	33,554,432 Hz
2^{24} (16,777,216)	2,097,152 Hz
2^{20} (1,048,576)	131,072 Hz
2^{16} (65,536)	8,192 Hz
2^{12} (4,096)	512 Hz
2^{8} (256)	32 Hz
2^{4} (16)	2 Hz

The 2^4 prescale factor is not recommended for input frequencies above 160 MHz, as it results in non-continuous measurements.

RESOLUTION:

2ns, or 1 edge of input.

PARITY Sampling:

Parity is a sample arming condition that arms a measurement after a signal edge on both input channels A and B has been detected. This mode is useful when measuring time intervals between edges that lead and follow one another randomly.

The parity sampling mode is available for ± Time Interval A→B and B→A measurements only.

PARITY MODE FREQUENCY RANGE:

Parity sampling is available for input signal frequencies from 125 mHz to 100 MHz.

EXTERNALLY GATED Sampling:

The frequency, period, or totalize sampling interval can be controlled by the leading and trailing edges of an external pulse on input channels A, B, or External Arm.

GATE WIDTH RANGE:

10 ns to 8.0 seconds.

SETUP DELAY:

30 ns TYPICAL.

AMPLITUDE:

The gating signal must meet dynamic range specifications for the input channel.

When using the EXTERNAL GATE mode with the TOTALIZE function, the maximum repetition rate of the external gating signal is 2.5 MHz.

MANUAL Sampling:

For TOTALIZE measurements the sampling of the totalize count occurs when the front panel MANUAL ARM key is pressed, or when the HP-IB commands GET (Group Execute Trigger) or *TRG (Trigger) are received.

MATH, STATISTICS, AND ANALYSIS FEATURES

Math:

Computations can be automatically performed on each measurement result in order to scale results to appropriate values. Separate math values are available for input channels A and B. Other instrument functions such as statistics, limit checking, and graphics are performed on this processed data.

The math functions are applied in the following manner:

$$\text{Math Result} = \left[\frac{\text{MEASUREMENT RESULT} - \text{Reference}}{\text{Normalize}} + \text{Offset}\right] \times \text{Scale}$$

NORMALIZE:

Raw measurement results, less the reference value, are divided by the NORMALIZE value. This value may not be 0.

Negative Range: $-1\times10^{12} <$ NORMALIZE value $< -1\times10^{-12}$.

Positive Range: $1\times10^{-12} <$ NORMALIZE value $< 1\times10^{12}$.

Resolution: 10 digits.

Default value: 1.

OFFSET:

The OFFSET value is added to the normalized result.

Negative Range: $-1\times10^{12} <$ OFFSET value $< -1\times10^{-12}$.

Positive Range: $1\times10^{-12} <$ OFFSET value $< 1\times10^{12}$, and 0.

Resolution: 10 digits.

Default value: 0.

SCALE:

After normalize and offset processing, the result will be multiplied by the SCALE value.

Negative Range: -1×10^{12} < SCALE value < -1×10^{-12}.

Positive Range: 1×10^{-12} < SCALE value < 1×10^{12}, and 0.

Resolution: 10 digits.

Default value: 1.

SET REFERENCE:

Set Reference is a constant value subtracted from each measurement result. The subtraction operation is performed before other math operations. Set Reference differs from the Offset value in that it is entered as the mean of the last sample set if statistics are enabled, or the last measurement value if statistics are disabled. The Set Reference value cannot be entered directly from the numeric keypad. Separate reference values are available for input channels A and B. Clear Reference sets the reference value to 0.

Default value: 0

LIMIT TEST:

Upper and lower limit values may be specified for each input channel A and B. Limit comparison is performed after the measurement block has been acquired. Measurements falling outside of the user-defined limits will be indicated on a numeric display. In addition, a bit will be set in the HP-IB status register, indicating an out-of-limit occurrence. Limit values are also denoted on the Time Variation and Histogram displays.

Negative Range: -1×10^{12} < LIMIT value < -1×10^{-12}.

Positive Range: 1×10^{-12} < LIMIT value < 1×10^{12}, and 0.

Resolution: 1×10^{-12}.

Statistics:

The following statistical values are available on a HP 5371A numeric display:

Mean

Minimum Value

Maximum Value

Variance

Standard Deviation

rms (Root Mean Square)

Allan Variance

Root Allan Variance (square root of the Allan Variance calculation).

Measurement sample sizes to 2 billion measurements are available (2 million, 1000 measurement blocks).

In addition, statistics on subsets of measurement data can be computed on the Histogram display. These statistics are: Mean, Minimum, Maximum, and Standard Deviation.

Graphic Analysis:

HISTOGRAM

Histograms, or probability density distributions, can be displayed for all measurement types. The user can define minimum and maximum limits for the histogram, or an auto-scaling feature can be used to scale the bin values. Linear or logarithmic scaling may be selected for the vertical axis. Measurements are acquired in blocks of up to 1000 measurements. Larger sample sizes may be obtained by specifying multiple blocks of measurements. The histogram can then be made to "grow" (accumulate) with each new block of data. Specific measurements are retained for the most recent measurement block.

The minimum and maximum values, as well as the number of bins may be defined by the user. The following number of bins are available: 5, 25, 125, 250, 500, and 1000.

TIME VARIATION

The Time Variation plot displays measurement values versus their time of occurrence. Measurement sizes up to 1000 measurements may be acquired and displayed.

The time variation display shows up to 125 separate values. These data points are connected by a line. For displays greater than 125 measurements, each measurement is depicted by a dot, while a line shows an average value of these measurement values. The "zoom" feature can then be used to magnify the display until 125 measurements are displayed on the screen. The dot is placed at the time of the completion of the measurement.

EVENT TIMING

The Event Timing graph depicts the starting and ending time of each time interval measurement. Start values are denoted with an upward tick mark while stop values are denoted with a downward tick mark. Up to 250 start and 250 stop points can be displayed separately on this graph. Measurement sizes up to 1000 measurements can be analyzed with this graph.

MEMORY

The HP 5371A queues measurements in an internal memory. The memory size (block size) is as follows:

1000 MEASUREMENTS:
Frequency, Period, Totalize A B A+B A–B B–A A/B B/A
Time Interval A B A→B B→A
± Time Interval A B A→B B→A
Continuous Time Interval A B
Rise/Fall Time A
Positive/Negative Pulse Width A
Phase A rel B B rel A
Duty Cycle A

500 MEASUREMENTS
Frequency, Period, Totalize A&B

1 MEASUREMENT
Peak Amplitudes A,B

When using the binary HP-IB output mode, the available measurement memory is increased to 4095 measurements (2047 for dual result measurements). Processing of these samples can then be performed on the raw data to compute the appropriate measurement results, using an instrument controller.

REAR PANEL SPECIFICATIONS

Option 060 Rear Panel Inputs:

50Ω, BNC inputs for channel A and channel B and a 1 MΩ, BNC input for External Arm are available on the HP 5371A rear panel with Option 060. Input pods are not available with Option 060 installed (HP 54002A pods are deleted from the Option 060 configuration). Input channel A and B performance is equivalent to front panel performance for this configuration. External Arm performance for the Option 060 configuration is as follows:

Range: dc coupled to 100 MHz.

Sensitivity: 100 mV rms sine wave.

280 $mV_{pk\text{-}pk}$ at a minimum pulse width of 5 ns.

Minimum Pulse Width: 5 ns (at a minimum amplitude of 280 $mV_{pk\text{-}pk}$).

Impedance: 1 MΩ NOMINAL, shunted by < 100 pf.

Dynamic Range: 280 $mV_{pk\text{-}pk}$ to 5 $V_{pk\text{-}pk}$, dc to 20 MHz.

280 $mV_{pk\text{-}pk}$ to 2.5 $V_{pk\text{-}pk}$, 20 MHz to 100 MHz.

Signal Operating Range: ± 5 Vdc.

⚠ **Damage Level:** 5 Vrms (± 15 $V_{pk\text{-}pk}$, dc ± peak ac).

All triggering specifications are the same as for the front panel configuration.

Frequency Standard External Input:

This BNC input will be automatically selected as the reference time base when a signal is present. The internal time base will be used when no signal is present at this BNC connector.

Impedance: 1 kΩ, ac coupled, NOMINAL.

Input Level Range: 1.0 $V_{pk\text{-}pk}$ to 5.0 $V_{pk\text{-}pk}$.

Acceptable Frequencies: 1 MHz, 2 MHz, 5 MHz, or 10 MHz, ± 1%.

⚠ **Damage Level:** ± 10V (dc ± peak ac).

Frequency Standard Output:

When no external reference is present, the HP 5371A internal 10 MHz oscillator signal is provided at this output. When an external reference is applied, this output will always be 10 MHz.

Frequency: 10 MHz (Time base specifications apply except for short-term stability).

Level: > 2 $V_{pk\text{-}pk}$ NOMINAL, ac coupled square wave into a high impedance.

>1 $V_{pk\text{-}pk}$ NOMINAL, ac coupled square wave into 50Ω.

Gate Outputs 1 and 2:

A falling edge indicates when measurement samples occur.

Delay: 30 ns TYPICAL.

Output Level: Falling edge active, TTL levels into ≥10 KΩ.

1 V (minimum) to 0 V into 50Ω.

Pulse Width: > 30 ns (TYPICAL) into 50Ω.

Arm Delay Outputs 1 and 2:

A falling edge occurs at these outputs with the completion of the arming condition. For example, if a time holdoff is specified, a falling edge will occur at the completion of the time holdoff.

Delay: 30 ns TYPICAL.

Output Level: Falling edge active, TTL levels into ≥10 KΩ.

1 V (minimum) to 0 V into 50Ω.

HP-IB CHARACTERISTICS

Interface Capabilities:

Subset Identifier	Interface Function
SH1	Complete source handshake capability
AH1	Complete acceptor handshake capability
T5	Basic talker with serial poll and talk-only capabilities
TE0	No extended talker capability
L4	Basic listener
LE0	No extended listener capability
DT1	Device trigger capability
DC1	Complete device clear capability
RL1	Remote/local capability
SR1	Serial poll capability
PP0	No parallel poll capability
C0	No controller capability
E2	Three-state drivers

HP-IB Address:

The HP-IB address can be changed via the SYSTEM menu. This address is saved in non-volatile memory. The default HP-IB address is 03.

Characteristic Measurement Output Rates:

The HP 5371A sends measurements to an external HP-IB controller at the completion of each block of measurements. Characteristic output rates are listed accordingly. For example, the typical binary output rate for the Continuous Time Interval Mode is 20,000 measurements per second. This should be interpreted as "up to twenty, 1000 measurement blocks can be transferred in 1 second to an instrument controller."

The HP 5371A can transfer data to an HP-IB instrument controller in one of three formats:

ASCII

IEEE Double Precision Floating Point (matches HP 9000 Series 200/300 controller floating point format, no character conversion is required for these controllers)

Binary (raw binary results from the HP 5371A counting hardware. Results can then be processed accordingly in the external computer)

For these benchmarks:

The HP 5371A is configured to the PRESET condition before the appropriate function is selected. Statistical and math operations are not enabled. In addition, the MANUAL input triggering mode is used to set the input voltage trigger levels.

Except where noted, a sample size of 10 blocks of 1000 measurements (10,000 total measurements) was used to determine these values.

All values include the measurement time, as well as the transfer time, of the data using an input signal of 13 MHz (76.9 ns).

For BINARY output rates, the values represent the number of measurements sent to the computer and stored in a buffer without processing. See note 5.

For these benchmark rates, the header information at the beginning of each block was not processed.

Note that these are TYPICAL values; performance is also affected by other instrumentation on the bus, the performance of the external controller, and the particular measurement software.

Table 1-1. HP 5371A Specifications (Continued)

Characteristic HP-IB Output Rate

MEASUREMENT MODE	(All values in "Readings per Second") ASCII	FLOATING POINT	BINARY
Time Interval A, B, A→B, B→A	150	350	12,500
Continuous Time Interval A , B	200	600	20,000
±Time Interval A, B, A→B, B→A	130	250	12,500
Frequency A, B	130	275	13,000
Frequency A&B (1)	50 per channel	110 per channel	5,300 per channel
Frequency A/B, B/A	90	140	5,500 per channel (3)
Frequency A–B, B–A, A+B	90	140	5,500 per channel (3)
Period A, B	130	275	13,000
Period A&B (1)	50 per channel	110 per channel	5,500 per channel
Period A/B, B/A	90	140	5,500 per channel (3)
Period A–B, B–A, A+B	90	150	5,500 per channel (3)
Totalize A, B	140	275	7,500
Totalize A&B (1)	80 per channel	175 per channel	5,200 per channel
Totalize A/B, B/A	90	175	5,200 per channel (3)
Totalize A-B, B-A, A+B	125	225	5,200 per channel (3)
Rise/Fall Time A	130	260	12,500 (4)
Pulse Width A	130	260	12,500 (4)
Phase A rel B, B rel A	90	150	12,500 (4)
Duty Cycle A	110	200	12,500 (4)
Peak Amplitudes A,B (2)	5	5	N/A

(1) 10 blocks of 500 measurements (5000 total) were used for this benchmark value.

(2) 10 measurements were used to characterize this value.

(3) These measurement rates are the same as the "A&B" mode. Appropriate math calculations must be performed in the controller when the results are processed.

(4) These measurement rates are essentially the same as the Time Interval A→B mode. Appropriate math operations must be included in the controller program to compute Phase A rel B, or B rel A and Duty Cycle A.

(5) Binary output mode rates do not include processing time in the controller. This processing time will vary with the controller, the program language, and the particular program. As an example: 10,000 conversions per second can be achieved using an HP 9000 Series 320 controller. This value excludes the transfer time of the data from the HP 5371A.

The user may also configure the HP 5371A to output BINARY data indefinitely to an external controller. This is achieved by configuring the HP 5371A for 1 block of 1 measurement, in the REPETITIVE acquisition mode. A single binary result will be transferred at a TYPICAL rate of 75 measurements per second. This rate will also depend on the particular controller as well as other instruments connected to the bus.

Direct Printer or Plotter Output

Any HP 5371A CRT display may be sent directly to an HP-IB graphics printer such as the HP 2225A ThinkJet Printer using the TALK ONLY mode. In addition, a list of measurement results can be printed directly from the front panel (up to 1000 values).

Any HP 5371A Time Variation graph, Histogram graph, or Event Timing graph may be sent directly to an HP-IB HP-GL plotter such as the HP 7440A ColorPro Plotter option 002.

Response Timeout

The response timeout feature enables the user to program the HP 5371A to generate a service request if the measurement is not completed within a specified time.

Timeout Range: 0 to 10 hours.

Resolution: 1 second.

Default Value: 5 seconds.

TIME BASE SPECIFICATIONS

HP 10811A Oven Oscillator

FREQUENCY:

10 MHz.

STABILITY:

Aging Rate:

$<5 \times 10^{-10}$ per day, after a 24 hour warm-up when:

1. oscillator off-time* was less than 24 hours.
2. oscillator aging rate was $<5 \times 10^{-10}$ per day prior to turn-off*.

$<5 \times 10^{-10}$ per day in less than 30 days of continuous operation for off-time* greater than 24 hours.

$< 1 \times 10^{-7}$ per year for continuous operation.

*"Turn-off", "turn-on", and "off-time" apply to periods when power is disconnected from the HP 5371A rear panel. Stand-by operation provides power to the oscillator's oven.

Short Term:

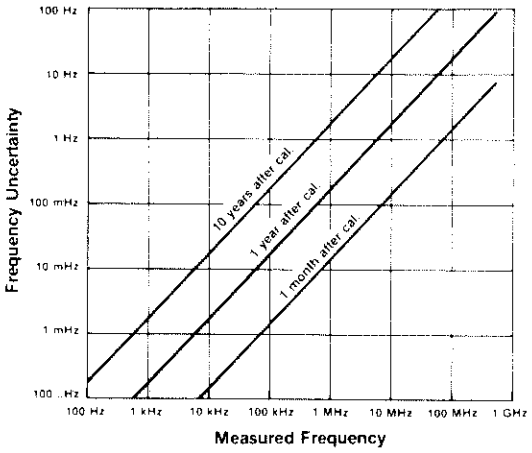
$< 1 \times 10^{-10}$ for a 1 second average.

Temperature:

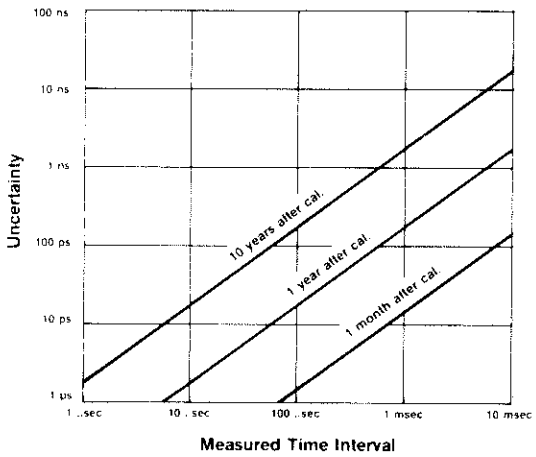
$< 7 \times 10^{-9}$, 0 to 40°C ambient temperature.

Line Voltage:

$< 1 \times 10^{-10}$ for 10% change from the NOMINAL line voltage.



Timebase crystal aging affects Frequency and Period measurement accuracy. You can further reduce aging uncertainty by using an atomic standard.



Timebase crystal aging affects time interval measurements.

Warm-up:

Within $<5 \times 10^{-9}$ of final value (see below) 10 minutes after turn-on* when:

1. HP 5371A is operated in a 25°C environment.
2. Oscillator off-time* was less than 24 hours.
3. Oscillator aging rate was $<5 \times 10^{-10}$ per day prior to turn-off*.

Final value is defined as oscillator frequency 24 hours after turn-on*

Refer to the Rear Panel Specifications Section for information regarding signal levels.

*"Turn-off", "turn-on", and "off-time" apply to periods when power is disconnected from the HP 5371A rear panel. Stand-by operation provides power to the oscillator's oven.

GENERAL SPECIFICATIONS

Dimensions:

WEIGHT:

Net, 23.2 kg (51 lbs); Shipping, 24.5 kg (54 lbs).

OPERATING TEMPERATURE:

0 to 40°C.

POWER REQUIREMENTS:

Voltages: 100, 120, 220, or 240 Vac; +10%, –10%.

Frequencies: 50 to 60 Hz.

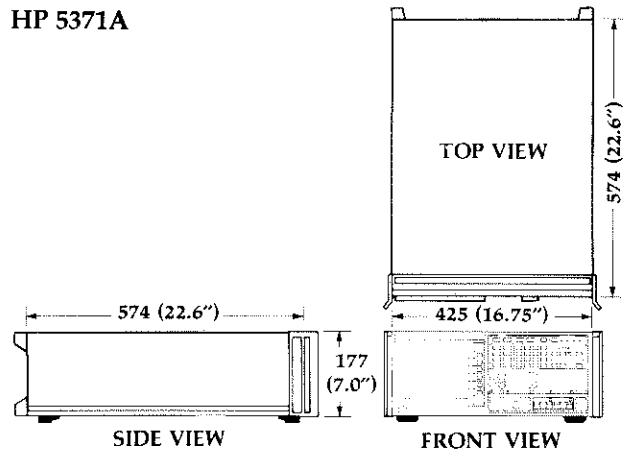
Maximum Power: 500 VA maximum.

Display Characteristics:

The HP 5371A features a raster-scan, green phosphor CRT. Screen display resolution is 408 pixels horizontally by 304 pixels vertically. Graph display resolution is 250 pixels horizontally by 200 pixels vertically.

For numeric displays, a BOLD feature is available to display results in large characters for viewing from a distance. Up to 12 measurements (6 measurements with associated "gate" data) can be displayed in the standard numeric display. All results may be viewed using scrolling features.

Results on the numeric screen will be displayed with a maximum of 15 digits, depending on the measurement resolution.



MEASUREMENT UNCERTAINTIES

All measured values have associated uncertainties. The following are definitions of terms used to describe these uncertainties. For frequency and time interval measurements and other specific implementations (i.e. rise time, pulse width, duty cycle etc.) this measurement uncertainty is composed of three factors: Least Significant Digit (LSD), Resolution, and Accuracy.

Least Significant Digit, Resolution, and Accuracy

Least Significant Digit is the smallest incremental value displayed in a measurement. The LSD for the HP 5371A is 200 ps, therefore, the smallest displayed increment that two single-shot time interval measurements will differ by is 200 ps.

Resolution is the smallest difference in measurements that the instrument can discern. Measurement resolution is of primary concern when comparing data gathered by a single instrument; in other words, the meaning of results when compared against one another. Resolution describes uncertainty due to random effects, including short-term oscillator stability, trigger error, and the internal noise of the instrument itself. Since these effects are random, the resolution uncertainty is specified on an rms basis rather than a peak value. The time interval single-shot resolution of the HP 5371A is 150 ps rms. Resolution can also be improved by averaging single measurements, or in the case of frequency and period measurements, by increasing the measurement gate time as well as averaging measurements.

Accuracy is defined to be the combination of random uncertainties and systematic or bias uncertainties in a measurement. Accuracy is of primary concern when comparing data in an absolute sense, such as one production test station to the next. Systematic uncertainties include differential channel delay, long term drift or time base oscillator aging, and trigger level timing error. These uncertainties may be measured and removed from subsequent measurement data by subtracting the measured bias. Two methods are available to do this with the HP 5371A: the SET REFERENCE feature for each input channel, or the HP J06-59992A Time Interval Calibrator.

Accuracy = Random Errors + Systematic Errors

Trigger Error and Trigger Level Timing Error

Resolution and accuracy equations consist of two terms which describe uncertainties due specifically to triggering. These terms are separated from others since they are, in general, dependent upon the user's signal. The following describes these input trigger uncertainties.

Trigger Error is a random uncertainty caused by noise on the input signal. Trigger error can be minimized by careful grounding and shielding techniques to minimize noise, and maintaining as high a signal slew rate as possible for the input to the HP 5371A. The following equation is used to quantify trigger error.

$$\text{Trigger Error} = \frac{\sqrt{(E_{amp})^2 + (E_n^2)}}{\text{Input Signal Slew Rate}}$$

Where:

E_{amp} is the typical rms input amplifier noise: (200 μV rms TYPICAL), and

E_n is the rms noise of the input signal over a 500 MHz bandwidth.

Trigger Level Timing Error is a systematic uncertainty due to the input hysteresis of the HP 5371A. Trigger Level Timing Error is a constant value for any particular signal and slew rate, but the effects will vary with amplitude and slew rate. Trigger Level Timing Error can be minimized by maintaining as high an input signal slew rate as possible.

$$\text{Trigger Level Timing Error} = \left(\frac{0.5 \times \text{hysteresis window}}{\text{Start Input Signal Slew Rate}} - \frac{0.5 \times \text{hysteresis window}}{\text{Stop Input Signal Slew Rate}} \right)$$

$$\pm \frac{\text{Trigger Level Accuracy}}{\text{Start Input Signal Slew Rate}} \pm \frac{\text{Trigger Level Accuracy}}{\text{Stop Input Signal Slew Rate}}$$

Table 1-2. HP 5371A Recommended Test Equipment

INSTRUMENT	REQUIRED CHARACTERISTICS	USE	RECOMMENDED MODEL/PART NUMBER
Oscilloscope	275 MHz Bandwidth	T	HP 1725A
Oscilloscope	1-GHz Bandwidth Channel vs. Channel Display Trigger Delay	A, T	HP 54100A
Synthesizer/Function Generator	125 mHz to 10 MHz Freq Range 45 mV to 5 Vp-p Amp Range –2.5V to +2.5V DC Offset Range	OV, P, A	HP 3325A
Signal Generator	10 MHz to 500 MHz Freq Range 50 mV to 500 mV Amp Range	P	HP 8656B
Digital Multimeter	100 μV Resolution in True RMS AC	A, T	HP 3455A
Synthesized Signal Generator	1 Hz Resolution at 500 MHz Output 10 dBm Amp at 500 MHz Output 50 mV Amp at 500 MHz Output	A	HP 8662A
Universal Frequency Counter	Duty Cycle at 1 kHz Input 0.001 Degree Resolution	A	HP 5335A
Support Service Kit	HP 5371A	A, T	05371-67001
Adapter	SMC(f) to BNC(f)	A	1250-0832
Adapter	N(m) to BNC(f)	P, A	1250-0780

*A= ADJUSTMENTS
P = PERFORMANCE TESTS
OV = OPERATION VERIFICATION
T = TROUBLESHOOTING

2 PERFORMANCE TESTS

SECTION 2
PERFORMANCE TESTS

2-1. INTRODUCTION

The three procedures in this section test the HP 5371A electrical performance using the specifications of *Table 2-2*. The first test is an operation verification which quickly checks all the major functions of the HP 5371A using the front panel controls. The second test is a verification of all specifications. The last test is an HP-IB operation verification that checks all the major remote-controllable functions. All tests can be performed without access to the interior of the instrument.

NOTE

If you are unfamiliar with the operation of the HP 5371A, it is recommended that you review Section 1 ("Getting Started") of the HP 5371A Operating Manual. This section provides a "hands-on" tutorial that will help you become familiar with most of the instrument's features. By making the prescribed measurements and analyzing their results, you will become more comfortable pressing the front panel keys and learn how the front panel controls are organized.

2-2. EQUIPMENT REQUIRED

The Operation Verification requires an HP printer with graphics capability. The equipment required to perform the Performance Test and HP-IB Operation Verification Test is summarized in *Table 2-1* and specified at the start of each test procedure.

2-3. CALIBRATION CYCLE

The HP 5371A requires periodic verification of performance. Depending on its use and environmental operating conditions, the HP 5371A should be checked using the following Performance Tests at least once a year.

2-4. POWER-UP AND SELF-TEST DIAGNOSTICS

During the operation verification tests, a power-up test and a Self-test are performed to verify proper operation of the instrument and, if needed, to assist maintenance personnel in identifying faulty assemblies within the HP 5371A. Both tests exercise the processing, memory, control, and measurement circuitry within the instrument. The Measurement Ram Test is always destructive to measurement data regardless of whether it is performed at power-up, from diagnostics, or via HP-IB. Also, back-up RAM memory is tested during power-up only, while additional testing of the front-panel keyboard controller is performed only during Self Test.

2-5. OPERATION VERIFICATION TESTS

The abbreviated tests given in OPERATION VERIFICATION paragraphs can be performed to give a high degree of confidence that the HP 5371A is operating properly without performing the complete performance test. The results of the HP 5371A Operation Verification Tests may be recorded on a copy of the "HP 5371A Performance Test Record" (located at the end of this section) and is in the form of a "PASS" or "FAIL" entry.

2-6. PERFORMANCE TESTS

The performance tests given in PERFORMANCE TEST paragraphs verify all the specifications listed in *Table 2-2*. Where specifications test the same circuitry, only one test is included; for example, frequency and period measurements use the exact same circuitry. The results of the HP 5371A Performance Tests may be recorded on a copy of the "HP 5371A Performance Test Record" found at the end of this section.

2-7. HP-IB OPERATION VERIFICATION TESTS

The program listed in *Table 2-5* exercises the HP 5371A operating modes via the HP-IB interface. The program is written in HP BASIC 3.0 and is forward-compatible with later revisions.

2-8. PERFORMANCE TEST RECORD

Results of the performance tests may be tabulated on the "HP 5371A Performance Test Record" at the end of this section. The Test Record lists all of the specifications and acceptable test limits for each test.

2-9. HP 5371A FRONT-PANEL INFORMATION

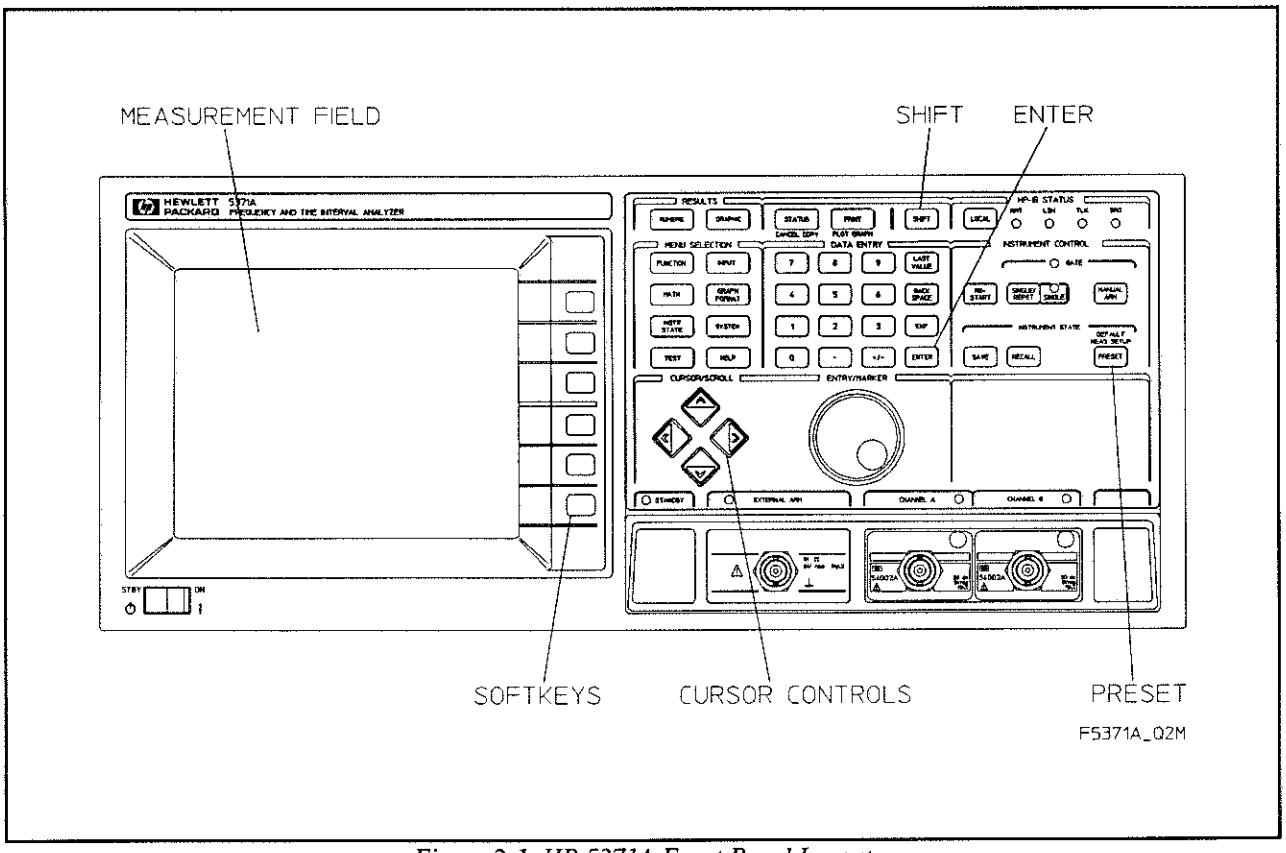


Figure 2-1. HP 5371A Front Panel Layout

A. The various control parameters are indicated by high-lighted fields in the display. (The fields are the inverse video boxes. They are referenced according to to the upper- and lower-case words closest to them. The "Measurement" field is the box in the upper, left-hand corner of the display.) The extra bright high-lighted field is called the menu cursor and is controlled by the cursor keys.

B. The softkeys, the six keys directly to the right of the CRT, provide access to various options for each menu parameter. Their functions depend on the selected menu field of the adjacent CRT screen display. Parameter options and menu operations associated with the selected menu field are displayed next to each softkey. Parameter options are always labeled in upper-case text, to distinguish them from menu operations, which are labeled in upper/lower-case text.

C. In the following text, softkeys names are shown in a darker typeface and specifically referred to as softkeys. All other labeled front-panel keys, called hard keys, are referred to by their capitalized function name. For example, "Press NUMERIC key and then press the **Result Displays** softkey".

D. If **More** is an available softkey option, pressing it will provide you with an additional screen of softkey selections. If you are instructed to press the **More** softkey and it is not a displayed option, press the **Return to Main Menu** softkey. This will take you to a higher level menu.

E. Most screens will show the first value in a series of measurements at the top-right corner of the display. To see all the measurements, you will have to view the Numeric Results Screen by pressing NUMERIC under the Results label in the upper left corner of the keyboard.

2-10. HP 5371A OPERATION VERIFICATION TESTS

2-11. Setup

2-12. POWER WARNINGS AND PRECAUTIONS

Refer to Section VII of this manual for the proper way to install the HP 5371A.

2-13. INPUT PODS

A. Insert the 50Ω BNC input pods (HP 54002A) into the HP 5371A front panel.

2-14. HP 5371A OPERATION VERIFICATION CABLE CONFIGURATION

A. Attach a BNC T-connector to the HP 5371A rear-panel FREQUENCY STANDARD OUTPUT.

B. Connect a 4-foot BNC cable from the T-connector to the HP 5371A Channel A input pod.

C. Connect a 4-foot BNC cable from the T-connector to the HP 5371A Channel B input pod.

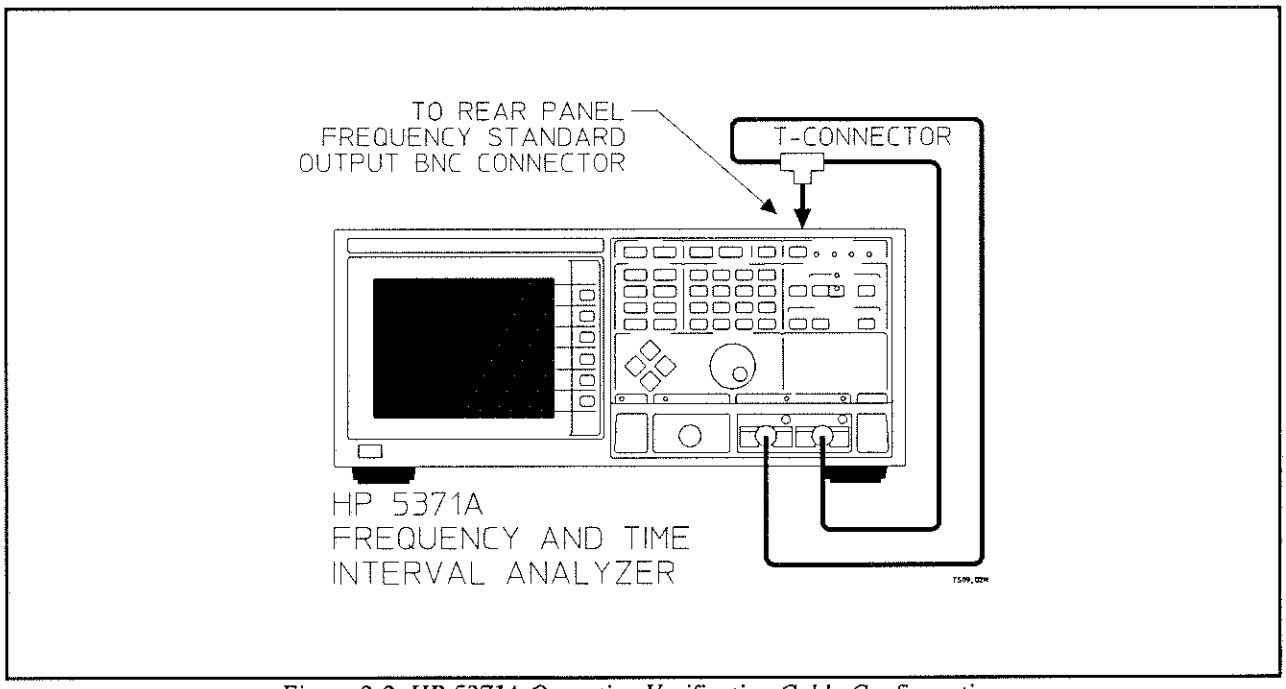


Figure 2-2. HP 5371A Operation Verification Cable Configuration.

2-15. Instrument Control Block

2-16. POWER-UP AND SELF-TEST

A. Set the HP 5371A power switch (STBY-ON) to ON. The front-panel STANDBY LED will extinguish.

NOTE

When power is first applied, the processor performs a self-test. If during this test or during operation, an error message is displayed, refer to Appendix A for an explanation of the error condition.

B. After 3 seconds, the screen displays the words, "Performing Self-Test...".

C. After a few more seconds, and if there are no error or failure messages, the Function screen is displayed.

D. Press TEST key.

E. Select "Self Test" either by entering test number via the data entry keypad or by moving the cursor directly to "Self Test".

F. Press **Run** softkey. The results of each test performed is listed on the Self-test screen and is followed by either "PASS" or "FAIL", depending on whether or not the test passed. The name of the test currently being executed is high-lighted on the Self-test screen. Other information provided is (1) the

message of the last observed failure, (2) the time of the last observed failure, (3) the total number of times the Self Test is run, and (4) the number of times the Self Test failed. In addition, to assist in fault isolation within the HP 5371A, each test is listed and grouped by board reference designator (i.e., "[1]" = A1, "[5]" = A5, etc.).

G. Press **Stop** softkey when satisfied that all tests have passed.

2-17. PRESET and SHIFT-PRESET

A. Press PRESET key.

NOTE

Pressing the PRESET key initializes the instrument settings to a known operating state. Use the PRESET key whenever you find yourself lost among the different screens or if you just want to start over setting the operating characteristics of the HP 5371A. In case you accidentally press the PRESET key, you can retrieve your last instrument setup by pressing the RECALL key and "0" on the Data Entry keypad. The current instrument setup is always stored away in Register "0" when the PRESET key is pressed.

B. The Function screen should be displayed.

Verify the following fields:

"Measurement" field = TIME INTERVAL
"Channel" field = A
"Arming Mode" field = AUTOMATIC

C. The GATE annunciator LED should be blinking rapidly, while both the Channel A and Channel B annunciator LEDs are blinking at at a comparatively slower rate. (The TLK annunciator may be lighted, but will have no effect on the operation verification procedure.)

D. Press SHIFT and then press PRESET key. (From now on this will be referred to as SHIFT-PRESET key.) This presets the instrument to a set of default values and state.

E. The Default Measurement Setup screen, Numeric Results/Statistics, should be displayed.

Verify the following:

Mean = 100.0 ns ±200 ps
Std Dev = 0 s up to 200 ps

2-18. SINGLE/REPET AND RESTART

A. Press SINGLE/REPET key.

B. The SINGLE annunciator LED will light and the GATE annunciator LED will turn off.

C. Press RESTART key. (The HP 5371A will make one measurement each time this key is pressed.)

D. The GATE annunciator LED should light up briefly each time RESTART key is pressed in the single mode. The values displayed are from the block of measurements initiated by pressing RESTART key. However, there may be little or no change in the values shown because the HP 5371A is measuring a very precise source.

2-19. MANUAL ARMING

A. Press PRESET key.

B. Press the **More** softkey.

C. Press the **TOTALIZE** softkey.

D. Move the cursor to the "Arming Mode" field.

E. Press the **Hold/Sampl Options** softkey and then the **MANUAL** softkey.

F. Press MANUAL ARM key, wait about 1 second, and press MANUAL ARM key again.

G. The value displayed in the top right of the function screen should be proportional to the amount of time you waited before pressing MANUAL ARM key the second time in Step F. For a one second time interval, the result should be about 10.000 000 M.

2-20. SAVE AND RECALL INSTRUMENT STATE

A. Press PRESET key.

B. Press SAVE key.

C. Press "1" on the Data Entry numeric keypad.

D. Press INSTR STATE key.

E. The Register 1 Description should display the words, "Time Intvl|Automatic". You have saved all the front panel settings in Register 1; the measurement mode and type of arming will be displayed in the description for Register 1.

2-21. Results

2-22. NUMERIC RESULTS

A. Press FUNCTION key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **More** softkey until the **CONTINUOUS TIME INTVL** softkey is a possible menu selection.

D. Press the **CONTINUOUS TIME INTVL** softkey.

E. Press SHIFT-PRESET key.

Verify the following:

Measurements 1 through 8 are displayed
Mean = 100.0 ns ±200 ps
Std Dev = 0 s up to 200 ps

F. Press the **Next Page** softkey. Measurements 9 through 16 should be displayed.

G. Press the **Gate Data** softkey. Measurements 9 through 12 should be displayed as well as the number of missed events, which equals 0. The **Gate Data** softkey acts like an electronic toggle switch.

H. Press the **Gate Data** softkey again.

I. Press the **Result Displays** softkey. The screen should display a new selection of softkeys.

J. Press the **Result** softkey. Measurements 9 to 20 should be displayed.

K. Press the **Statistics** softkey. Statistical information (such as the mean, standard deviation, and others) should be displayed.

L. Press the **Bold** softkey. A current measurement value and some current statistics should be displayed in enlarged characters.

2-23. GRAPHIC RESULTS

A. Press SINGLE/REPET key to stop the repetitive measurements. The SINGLE annunciator LED should come on.

B. Press GRAPHIC key.

C. A histogram should be displayed that shows a large bar and, in some cases, much smaller bars. The smaller bars indicate that 1 or 2 of the measurements were slightly lower or higher than average. The X-axis range should be somewhere between 99.0 ns and 101.0 ns. Such a histogram is shown in *Figure 2-3*.

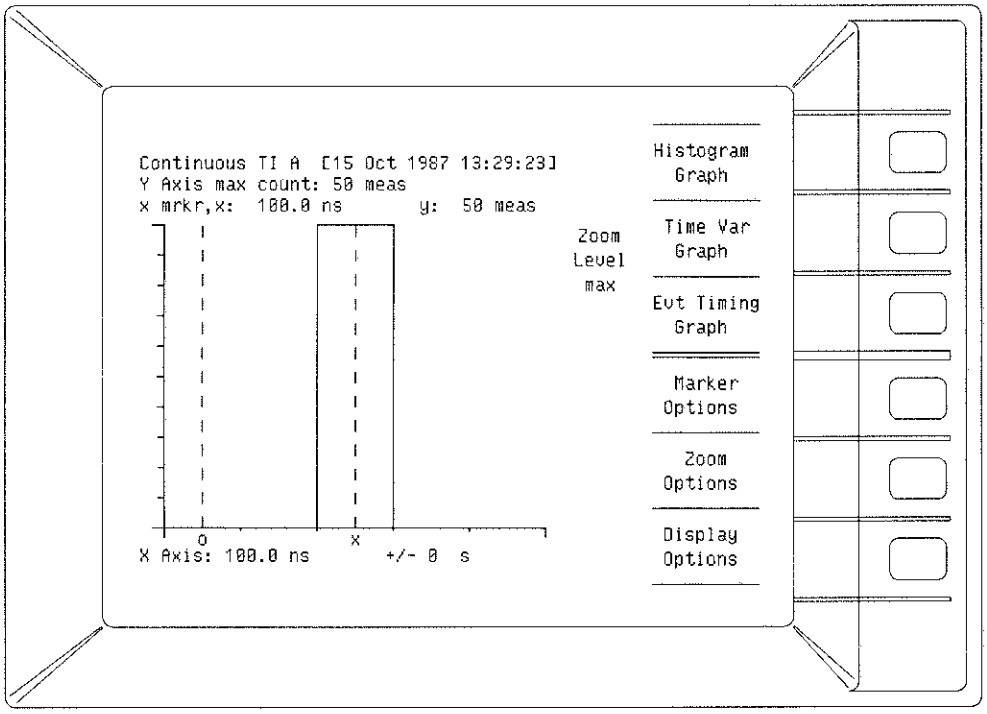


Figure 2-3. Histogram Graph

D. Rotate the ENTRY/MARKER knob to move the X-marker to the center of the large bar.

E. The X-marker description line should display 100.0 ns ±0.1 ns.

F. Press the **Time Var Graph** softkey. The variation of the frequency with time should be displayed. The Y-axis information line should display a range somewhere between 99.8 ns and 100.2 ns. The graph can show a frequency variance anywhere within these limits. One such graph is shown in *Figure 2-4*.

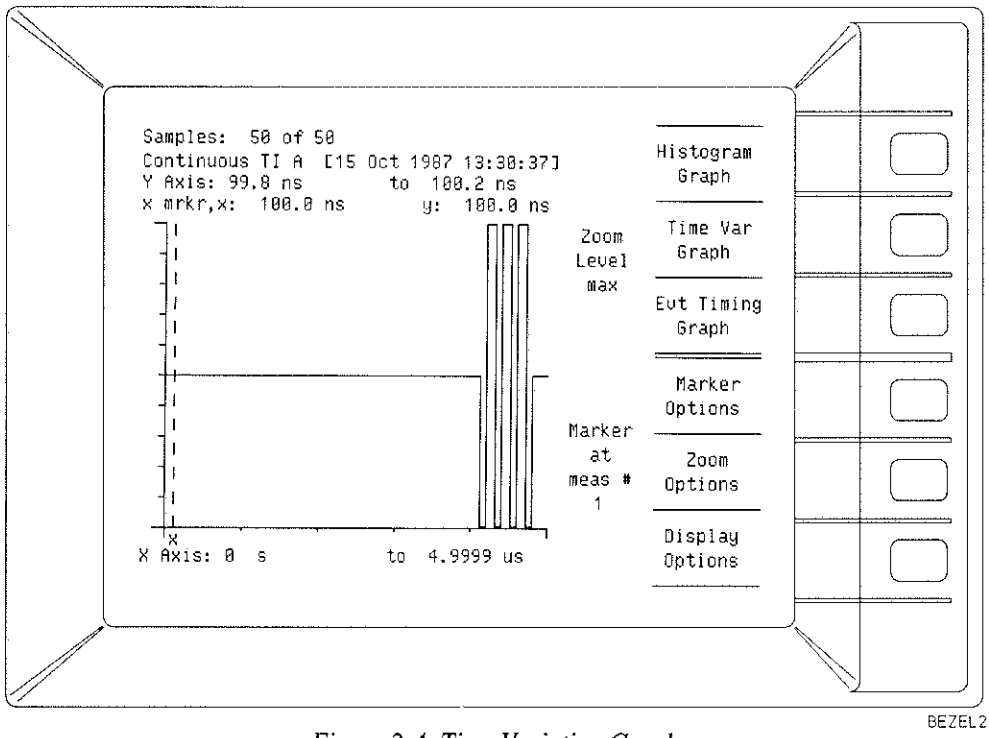


Figure 2-4. Time Variation Graph

G. Press the **Evt Timing Graph** softkey.

H. Press **Zoom Options** softkey.

I. Press **Zoom in** softkey.

J. The display should be as shown in *Figure 2-5*. The vertical lines above and below the main horizontal line represent start and stop points, respectively. Since the continuous time interval measurement mode needs no time between measurements, the start lines should be directly above the stop lines.

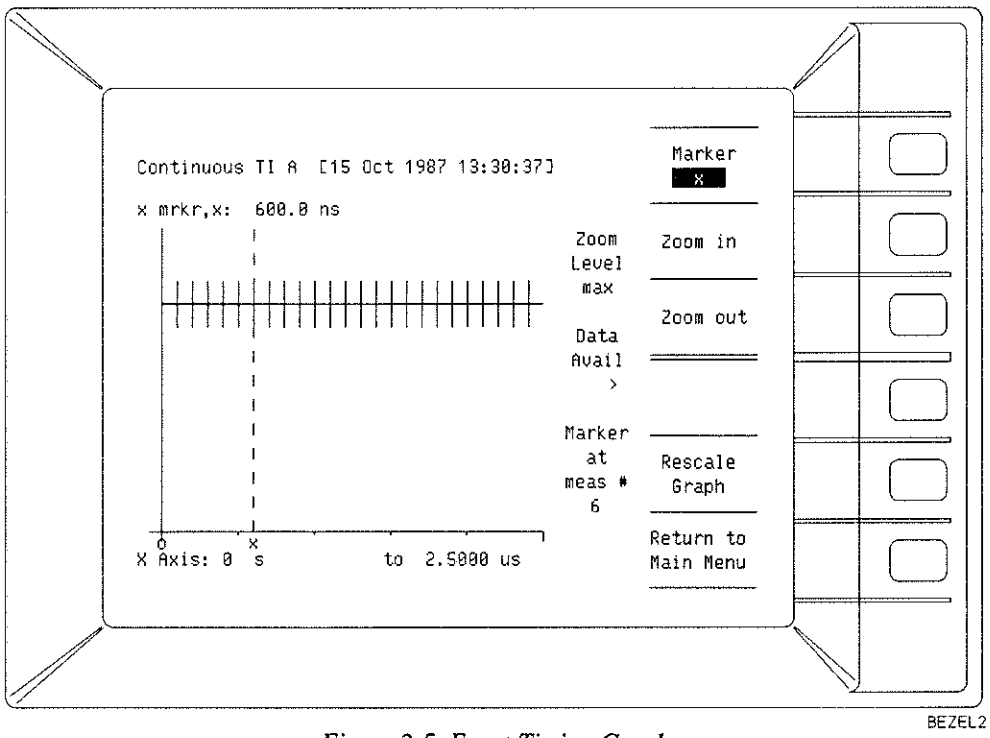


Figure 2-5. Event Timing Graph

2-24. Measurement Modes

NOTE

The Time Interval and Continuous Time Interval measurement functions are tested by the Instrument Control Block and Results procedures (performed earlier in the Operation Verification) and therefore are not tested in the following procedures. In addition, Rise Time, Fall Time, Phase, Duty Cycle, Positive Pulse Width, Negative Pulse Width, and Period measurements are also not tested directly since they are variations of the measurements tested below.

2-25. ± TIME INTERVAL MEASUREMENT

A. Press PRESET key.

B. Press the ± **TIME INTERVAL** softkey. The measurement is now started on Channel A and finished on Channel B.

C. The result displayed should be 0 s ± 200 ps.

2-26. FREQUENCY MEASUREMENTS

A. Press the **FREQUENCY** softkey.

B. Move the cursor to the "Channel" field if not there already.

C. Press the **A&B** softkey.

D. Press INPUT key.

E. Move the cursor to the "Input Channels" field if not there already.

F. Press the **COMMON** softkey.

G. The measurements shown at the top of the display should both be between 9.99 MHz and 10.01 MHz.

2-27. TOTALIZE MEASUREMENTS

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **More** softkey.

D. Press the **TOTALIZE** softkey.

E. The result displayed should be approximately 100.

2-28. PEAK AMPLITUDE MEASUREMENTS

A. Press the **More** softkey.

B. Press the **PEAK AMPLITUDE** softkey.

C. The maximum should be approximately +450 ±100 mV. The minimum should be approximately –500 ±100 mV.

D. Move the cursor to the "Channel" field.

E. Press the **B** softkey.

F. The maximum should be approximately +450 ±100 mV. The minimum should be approximately –500 ±100 mV.

2-29. Arming

NOTE

Since several of the arming modes are used in many measurement functions, it is only necessary to test an arming mode in one measurement function in order to ensure proper operation.

2-30. FREQUENCY ARMING MODES

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already, press the **More** softkey, and then press the **FREQUENCY** softkey.

C. Move the cursor to the "Arming Mode" field.

D. Press the **Return to Main Menu** softkey if available.

E. Press the following softkeys and verify that the values displayed at the top of the the Function screen are approximately the same as those below:

Sampling Options
INTERVAL SAMPLING ..... 10.000 0 MHz
TIME SAMPLING ..... 10.000 000 000 MHz
CYCLE SAMPLING ..... 10.000 MHz
EDGE SAMPLING ..... 10.00 MHz
Return to Main Menu

F. Press the **Hold/Sampl Options** softkey and continue:

EDGE/INTERVAL ..... 10.000 0 MHz
EDGE/TIME ..... 10.000 000 000 MHz
EDGE/EDGE ..... 10.00 MHz
EXTERNALLY GATED ..... 10.00 MHz

G. Press the **More** softkey and continue:

EDGE/CYCLE ..... 10.000 MHz
EDGE/EVENT ..... 10.00 MHz
TIME/INTERVAL ..... 10.000 0 MHz
TIME/TIME ..... 10.000 000 000 MHz

H. Press the **More** softkey and continue:

EVENT/INTERVAL ..... 10.000 0 MHz
EVENT/EVENT ..... 0 Hz

2-31. ± TIME INTERVAL ARMING MODES

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already, and press the ± **Time Interval** softkey.

C. Move the cursor to the "Arming Mode" field and press **Return to Main Menu** softkey if available.

D. Press the following softkeys and verify that the values displayed at the top of the Function screen are approximately the same as those below:

Sampling Options
PARITY SAMPLING .....0 s ±200 ps
REPETITIVE EDGE .....0 s ±200 ps
REPETITIVE EDGE/PARITY ..0 s ±200 ps
Return to Main Menu

E. Press the **Holdoff Options** softkey and continue:

EDGE HOLDOFF .....0 s ±200 ps
Return to Main Menu

F. Press the **Hold/Sampl~Options** softkey and continue:

EDGE/PARITY .....0 s ±200 ps

2-32. Input Screen

2-33. SEPARATE/COMMON INPUT

A. Press PRESET key.

B. The result at the top of the display should be 100.0 ± 0.2 ns.

C. Move the cursor to the "Channel" field.

D. Press the **A→B** softkey.

E. Press INPUT key.

F. The result displayed at the top right corner of the screen should be approximately 100 ns.

G. Move the cursor to the "Input Channels" field if not already there, and press the **COMMON** softkey. The value displayed should stay at 100.0 ±0.2 ns.

2-34. TRIGGER LEVELS

A. Move the cursor down to the "Chan A: Slope" field and press the **NEG** softkey.

B. The result displayed at the top-right corner should now read approximately 50 ns ±5 ns.

C. Move the cursor over to the "Chan A: Level" field and change the trigger level to 0% by rotating the ENTRY/MARKER knob.

D. The result displayed just to the right of the "Chan A: Level" field should be 500 ±100 mV.

E. Press "1" on the Data Entry numeric keypad, then "0", and then "0". If you press the wrong number, use BACK SPACE to correct your error. Now press ENTER key. You have specified the trigger level at 100% of the input signal height.

F. The value displayed next to the "Chan A: Level" field should be approximately +450 ± 100 mV.

2-35. Math Screen

2-36. REFERENCE VALUES

A. Press PRESET key.

B. Press MATH key. The result displayed at the top-right corner of the screen should be 100.0 ±0.2 ns.

C. Press the **Set Ch A Reference** softkey. The result displayed for Channel A Reference should read about 100.0000000E-09 (i.e., 100.0 ns). The result displayed in the top right corner should read 0 s ± 200 ps.

D. Press the **Clear Ch A Reference** softkey and the result displayed should read 0E+00 while the result at the display's top-right corner should read 100.0 ±0.2 ns.

NOTE

The "RESULTS" paragraphs tested the instrument's statistical capabilities. Therefore, statistical functions will not be included in the following test.

2-37. MATH FUNCTIONS

A. Move the cursor down to the "Channel A Math" field and press the **ON** softkey.

B. Move the cursor down to the "Normlz" field.

C. Press "2" on the numeric keypad. Press ENTER key.

D. The result displayed at the top-right corner of the screen should be 50 ± 0.10 ns as indicated in *Figure 2-6*. The measured result of 100.0 ±0.2 ns has been divided by 2.

E. Press "1" on the numeric keypad. Press ENTER key. The measured result of 100 ±0.2 ns has been divided by 1.

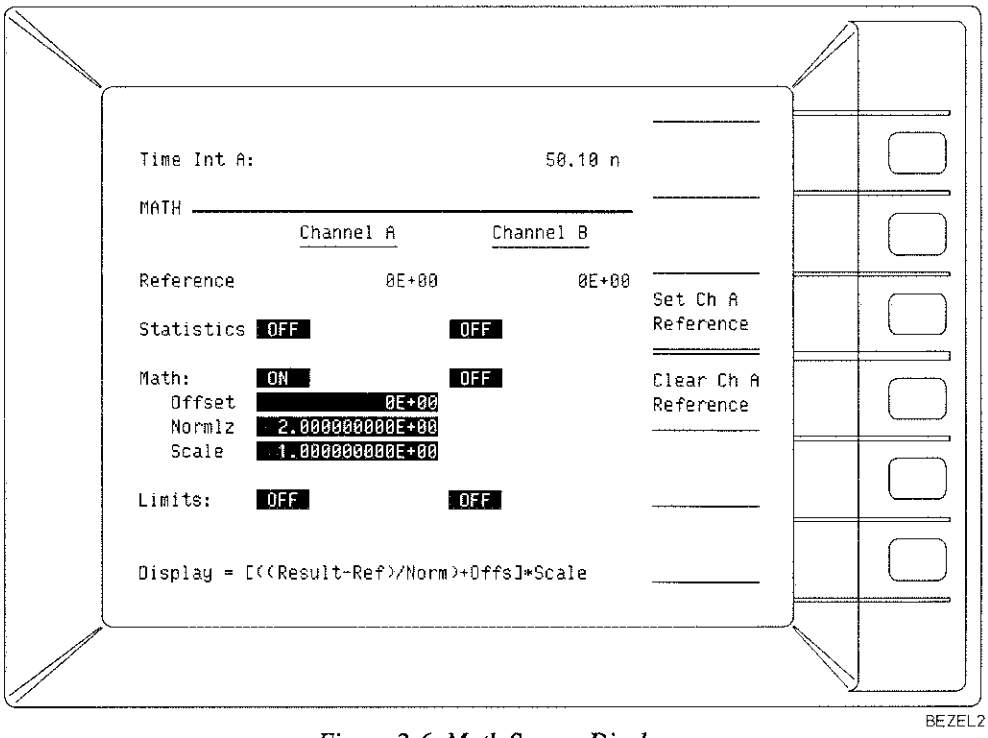


Figure 2-6. Math Screen Display

2-38. LIMITS

A. Move the cursor down to the "Channel A Limits" field and press the ON softkey.

B. Move the cursor down to the "High Limits" field.

C. Press "1" on the numeric keypad. Press ENTER key.

D. Press NUMERIC key.

E. The Numeric screen should display "Math/Ref On" above the measurements and "Pass" after the measurement as indicated in *Figure 2-7.*

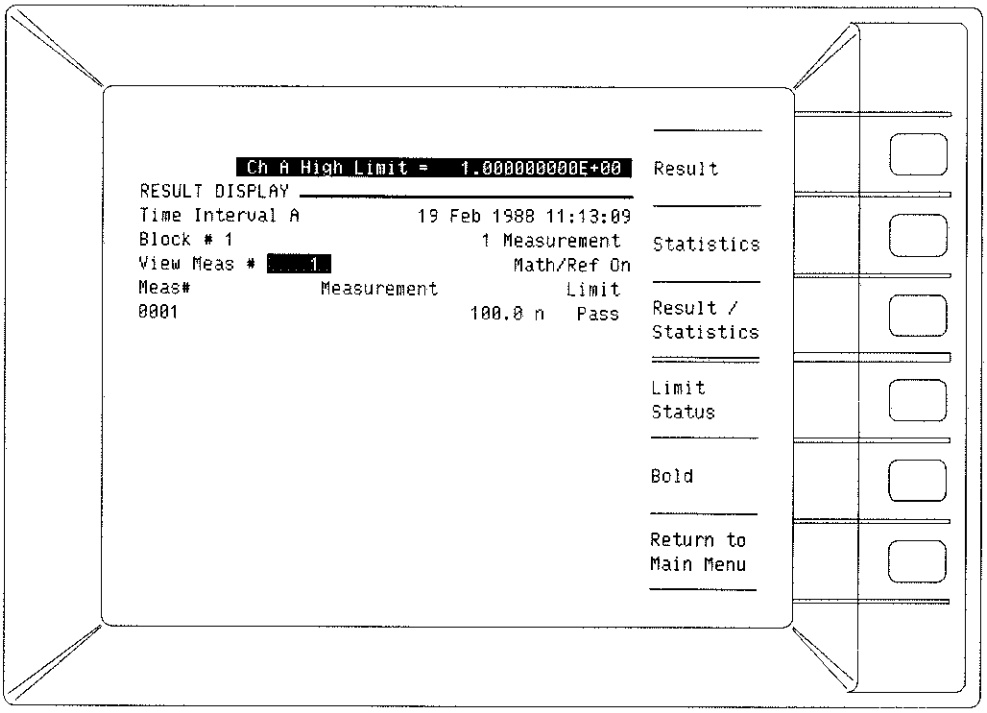


Figure 2-7. Numeric Screen With Math Data

2-39. HP-IB and PRINT

2-40. HP-IB and PRINT/PLOT Graph

NOTE

Disconnect HP-IB interface cables that may be connected between the HP 5371A and an external controller before proceeding with the "HP-IB and PRINT/PLOT Graph" test.

A. Set the HP 5371A STBY-ON power switch to STBY.

B. Obtain an HP-IB graphics printer, such as the "ThinkJet" HP 2225A, and an HP-IB cable. Plug in the printer, but do not turn the power switch on.

C. Connect one end of the HP-IB cable to the HP 5371A rear panel HP-IB connector.

D. Connect the other end of the cable to the printer.

E. Locate the row of switches on the rear panel of the printer. Flip the switch that will enable the LISTEN ONLY mode for the printer. For the "HP ThinkJet" printer, this will be switch #2.

F. Set the printer power switch to ON.

G. Set the HP 5371A power switch to ON. Allow the instrument enough time to perform its power-up testing.

H. Press PRESET key.

I. Press SYSTEM key.

J. The "Addressing Mode" field should be high-lighted. Press the **Talk~Only** softkey if not already selected.

K. Press PRINT key.

L. The printer should print a copy of the System screen as shown above in *Figure 2-8*.

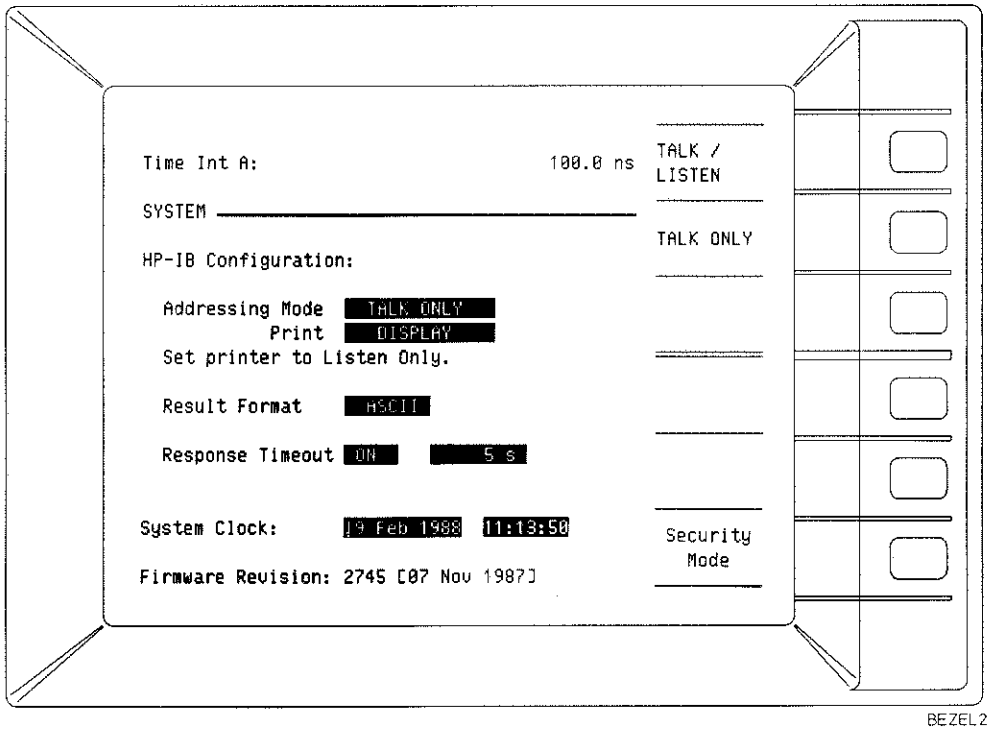


Figure 2-8. System Screen Printout

THE HP 5371A OPERATION VERIFICATION TESTS ARE NOW COMPLETE.

2-41. HP 5371A PERFORMANCE TESTS

2-42. Equipment Required

Results of the following Performance Tests for the HP 5371A Frequency and Time Interval Analyzer may be recorded on a copy of the "HP 5371A Performance Test Record" card provided at the end of this section.

Table 2-1. HP 5371A Recommended Test Equipment List

INSTRUMENT	REQUIRED CHARACTERISTIC	RECOMMENDED MODEL
Synthesizer/Function Generator	125 mHz to 10 MHz Frequency 45 mV to 5 V(p-p) Amplitude Range –2.5V to +2.5V DC Offset Range	HP 3325A
Signal Generator	10 MHz to 500 MHz Frequency 45 mV to 5 V(p-p) Amplitude Range 50 mV to 500 mV Amplitude Range	HP 8656B
Adapter	N(m)-to-BNC(f)	HP P/N 1250-0780

Test equipment other than those specified may be substituted if they meet the specifications listed in *Table 2-2*. *Table 2-2* lists a summary of the eight tests and the specifications tested. The tests must be performed in the order listed.

Table 2-2. Specifications Tested by Performance Tests

PARAGRAPH NO.	TEST DESCRIPTION	SPECIFICATIONS TESTED
2-10	Operation Verification	Pass/Fail
2-48	Dynamic Input/Operating Ranges	X1: Dynamic: 45 mV to 2 V(p-p) Operating: -2V to +2 V
2-52	X2.5 Attenuation	X2.5: Dynamic to 5 V(p-p) (With 50Ω pod only)
2-56	Sensitivity/Minimum Pulse Width	Minimum Pulse Width of 1 ns
2-60	Auto Trigger	1 kHz to 200 MHz 200 mV p-p
2-66	Measurement Range	Frequency: 125 mHz to 500 MHz Peak Amplitude: 200 mV to 2 V(p-p) (Within the 1kHz to 200 MHz range)
2-70	Arming and Gating Ranges	Event Holdoff: 4×10^9 Time Holdoff: 2 ns to 8 s Gate Timer: 600 ns to 8 s
2-76	HP-IB Operation Verification Program	Pass/Fail

2-43. Test Equipment Turn-on

2-44. HP 5371A TURN-ON

A. Refer to Section VII of this manual for HP 5371A installation procedures.

B. Insert the 50Ω input pods (HP 54002A) into the HP 5371A front panel.

C. Disconnect any HP-IB cables from the rear panel.

D. Switch the power switch from STBY to ON.

NOTE

When power is first applied, the processor performs a self-test. If during this test, or during operation, an error message is displayed, refer to Appendix A for an explanation of the error condition.

E. After 3 seconds, the screen displays the words, "Performing Self-Test...".

F. After a few more seconds, if there are no errors, the Function screen is displayed.

G. Disconnect any cables connected to Channel A input pod, Channel B input pod, and/or the EXTERNAL ARM input connector.

2-45. HP 3325A TURN-ON

A. Disconnect any HP-IB cables from the rear panel.

B. Allow at least twenty minutes between plugging the power cord in and turning the HP 3325A power on.

C. Turn the power switch from STBY to ON.

D. If the HP 3325A display indicates that there are any errors, refer to the HP 3325A Operating Manual.

E. Press the square wave (10 MHz) FUNCTION key.

2-46. HP 8656B TURN-ON

A. Disconnect any HP-IB cables from the rear panel.

B. Allow at least 1 hour between plugging the power cord in and turning the HP 8656B power on.

C. Turn the power switch from STBY to ON.

D. If the HP 8656B display indicates that there are any errors, refer to the HP 8656B Operating Manual.

E. Attach an N(m)-to-BNC(f) adapter to the RF OUTPUT connector.

2-47. HP 5371A Operation Verification Tests

Perform the HP 5371A Operation Verification presented earlier in this section. Enter "PASS" or "FAIL" on the "HP 5371A Performance Test Record" located at the end of this section.

2-48. Dynamic Input and Operating Range Test

Equipment Used: HP 3325A Synthesizer/Function Generator
Test Setup Used: Figure 2-16A (see foldout located at the end of this section)
HP 5371A Specifications Tested (X1 Attenuation):

Dynamic Range: 45 mV to 2 V(p-p)
Operating Range: –2 V to +2 V

2-49. HP 5371A SETUP

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **FREQUENCY** softkey.

D. Move the cursor to the "Channel" field.

E. Press the **A&B** softkey.

F. Move the cursor to the "Arming Mode" field.

G. Press **Sampling Options** softkey followed by **INTERVAL SAMPLING** softkey.

H. Move the cursor to the "intervals" field.

I. Press "1" on the Data Entry numeric keypad. Press ENTER key. The "intervals" field should now read "1.0000 s". (The HP 5371A front-panel CRT display should appear as in *Figure 2-9.)*

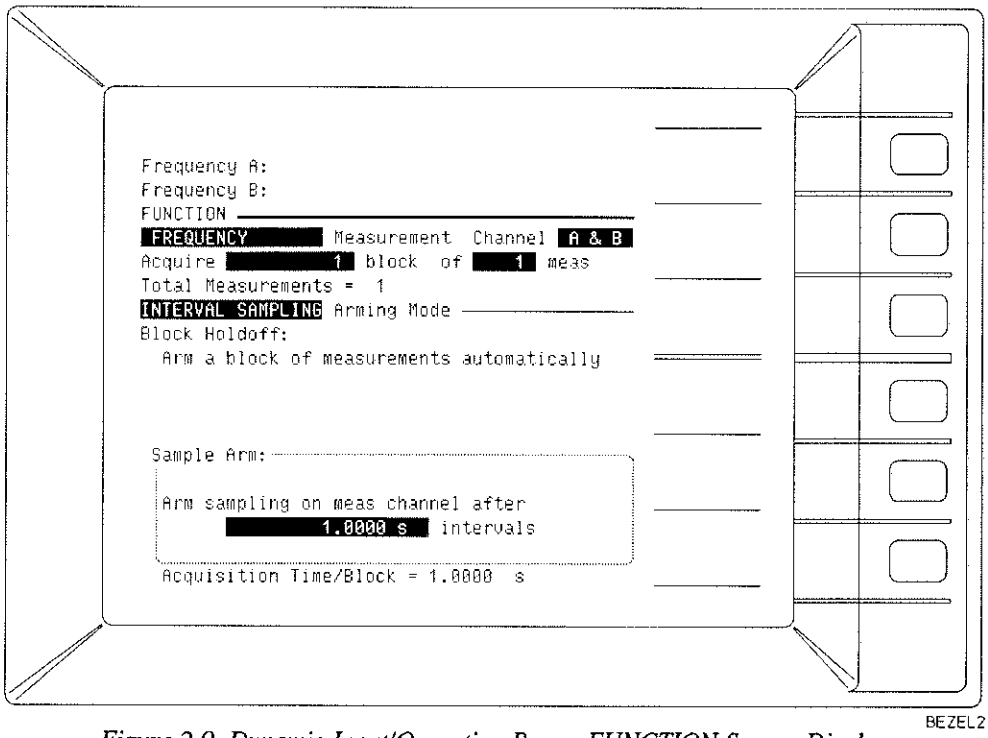


Figure 2-9. Dynamic Input/Operating Range FUNCTION Screen Display

J. Press INPUT key.

K. Move the cursor to the "Input Channels" field if not there already.

L. Press the COMMON softkey.

M. Move the cursor to the "Chan A: Mode" field.

N. Press the MANUAL TRIG softkey.

O. Move the cursor to the "Chan B: Mode" field.

P. Press the MANUAL TRIG softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-10.)*

Q. Press SINGLE/REPET key. The SINGLE annunciator LED should now be lighted.

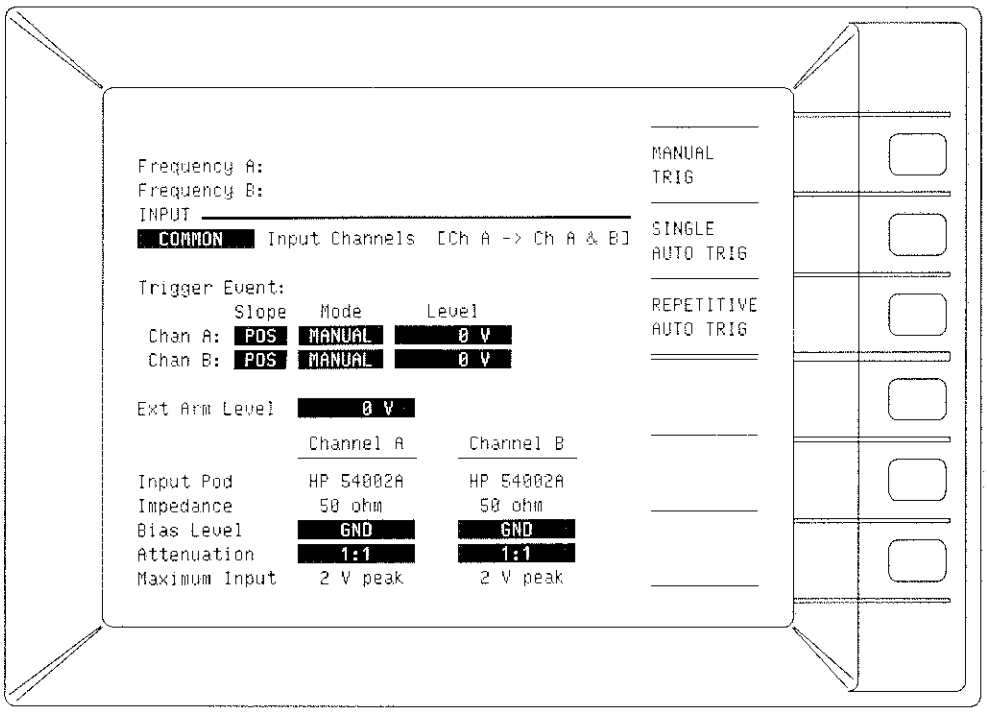


Figure 2-10. Dynamic Input/Operating Range INPUT Screen Display

2-50. HP 3325A SETUP

A. Press AMPTD, enter "45", and press mV key.

B. Press FREQ, enter "10", and press MHz key.

C. Connect the HP 5371A Channel A input pod to the HP 3325A SIGNAL output using a BNC cable (see *Figure 2-16A* located at the end of this section).

2-51. DYNAMIC INPUT AND OPERATING RANGE TEST PROCEDURE

A. The HP 5371A Channel A and Channel B annunciator LED's should be flashing.

B. Press HP 5371A RESTART key.

C. The top of the HP 5371A CRT should display two values both between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter these values on the "HP 5371A Performance Test Record".

D. Press the HP 3325A AMPTD key, enter "2", and press VOLT key.

E. Press HP 5371A RESTART key.

F. The HP 5371A should display two values both between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter these values on the "HP 5371A Performance Test Record".

G. Press the HP 3325A DC OFFSET key, enter "-1", and press VOLT key.

H. On the HP 5371A, move the cursor to the "Chan A: Mode" field if not there already. Press the **REPETITIVE AUTO TRIG** softkey. Move the cursor to the "Chan B: Mode" field. Press the **REPETITIVE AUTO TRIG** softkey. Press RESTART key.

I. The HP 5371A should display two values, both between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter these values on the "HP 5371A Performance Test Record".

J. Press the HP 3325A DC OFFSET key, enter "1", and press VOLT key.

K. Press the HP 5371A RESTART key.

L. The HP 5371A should display two values both between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter these values on the "HP 5371A Performance Test Record".

2-52. X2.5 Attenuation Test

Equipment Used: HP 3325A Synthesizer/Function Generator
Test Setup Used: *Figure 2-16A* (see foldout located at the end of this section)
HP 5371A Specification Tested (X2.5 Attenuation):

Dynamic Range: Up to 5 V(p-p)

2-53. HP 5371A SETUP

A. Move the cursor to the "Channel A Attenuation" field.

B. Press the **2.5:1** softkey.

C. Move the cursor to the "Channel B Attenuation" field.

D. Press the **2.5:1** softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-11.)*

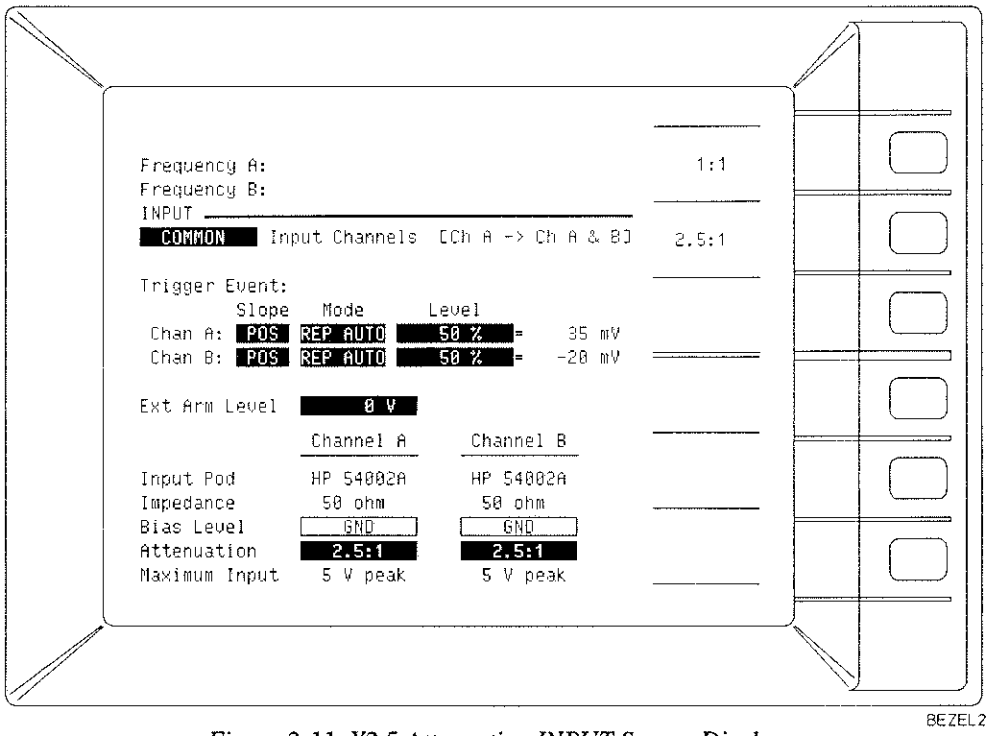


Figure 2-11. X2.5 Attenuation INPUT Screen Display

2-54. HP 3325A SETUP

A. Press DC OFFSET, enter "0", and press VOLT key.

B. Press AMPTD, enter "5", and press VOLT key.

2-55. X2.5 ATTENUATION TEST PROCEDURES

A. Press the HP 5371A RESTART key.

B. The HP 5371A CRT should display two values both between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter the "Frequency A;" value on the "HP 5371A Performance Test Record".

C. Detach the cable from the HP 5371A Channel A input pod and re-attach it to the Channel B input pod.

D. Move the HP 5371A cursor to the "Input Channels" field and press the **Separate** softkey.

E. Press HP 5371A FUNCTION key.

F. Move the HP 5371A cursor to the HP 5371A "Channel" field.

G. Press the HP 5371A B softkey.

H. Press HP 5371A RESTART key.

I. The HP 5371A CRT should display a "Frequency B:" value between 9.999 999 980 MHz and 10.000 000 020 MHz. Enter this value on the "HP 5371A Performance Test Record".

2-56. Sensitivity/Minimum Pulse Width Test

Equipment Used: HP 8656B Signal Generator
Test Setup Used: *Figure 2-16B* (see foldout located at the end of this section)
HP 5371A Specification Tested: Minimum Pulse Width of 1 ns

2-57. HP 5371A SETUP

A. Detach the cable from the Channel B input pod and re-attach to the Channel A input pod.

B. Detach the cable from the HP 3325A.

C. Press the "Channel" field **A&B** softkey.

D. Press INPUT.

E. Move cursor to "Input Channels" field if not there already and press the **COMMON** softkey.

F. Move the cursor to the "Chan A: Mode" field.

G. Press the **MANUAL TRIG** softkey.

H. Move the cursor to the "Chan B: Mode" field.

I. Press the **MANUAL TRIG** softkey.

J. Move the cursor to the "Channel A Attenuation" field.

K. Press the **1:1** softkey.

L. Move the cursor to the "Channel B Attenuation" field.

M. Press the **1:1** softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-12.)*

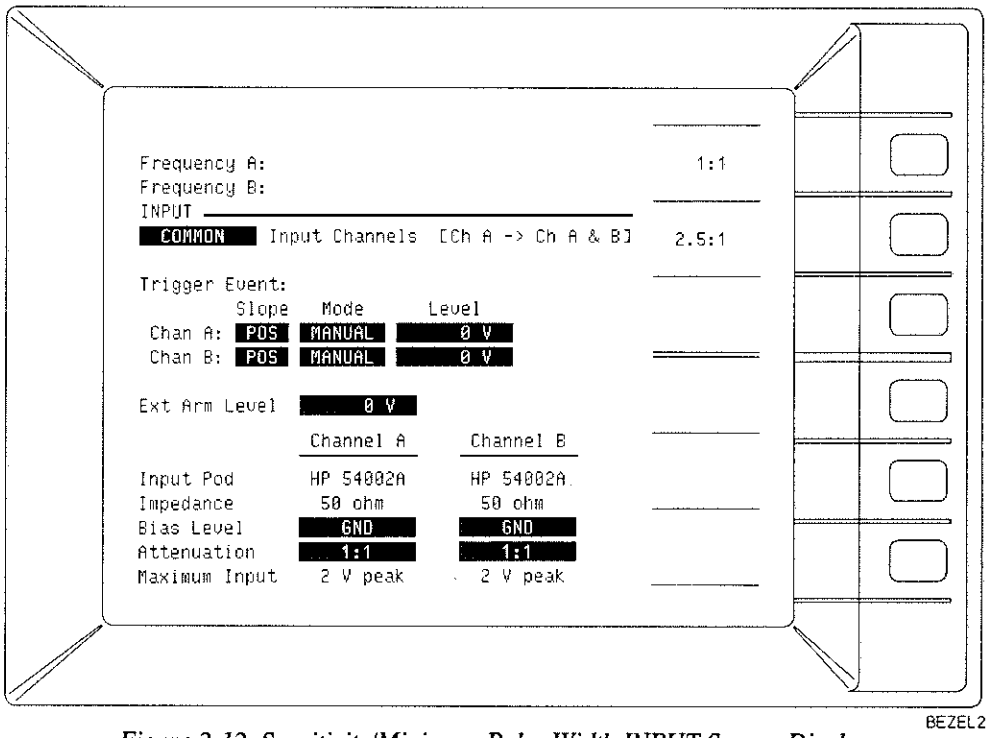


Figure 2-12. Sensitivity/Minimum Pulse Width INPUT Screen Display

2-58. HP 8656B SETUP

A. Connect a BNC cable from the HP 8656B rear panel timebase input (INPUT) to the HP 5371A rear-panel Frequency Standard OUTPUT. (See *Figure 2-16B* for test setup.)

B. Press AMPTD, enter "50", and press mV key.

C. Press FREQUENCY, enter "500", and press MHz key.

D. Connect the other end of the BNC cable attached to the HP 5371A Channel A input pod to the HP 8656B RF OUTPUT BNC Adapter.

E. The HP 5371A Channel A and Channel B annunciator LEDs should be flashing.

2-59. SENSITIVITY/MINIMUM PULSE WIDTH TEST PROCEDURE

A. Press the HP 5371A RESTART key.

B. The HP 5371A screen should display a value between 499.999 985 00 MHz and 500.000 015 00 MHz for both Channel A and Channel B measurements. Enter these values on the "HP 5371A Performance Test Record".

2-60. Auto Trigger Test

Equipment Used: HP 3325A Synthesizer/Function Generator
HP 8656B Signal Generator
Test Setups Used: Figures 2-16A and 2-16B
HP 5371A Specification Tested:

Range: 1 kHz to 200 MHz at 200 mVp-p

2-61. HP 5371A SETUP

A. Move the cursor to the "Chan A: Mode" field.

B. Press the **REPETITIVE AUTO TRIG** softkey.

C. Move the cursor to the "Chan B: Mode" field.

D. Press the **REPETITIVE AUTO TRIG** softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-13.)*

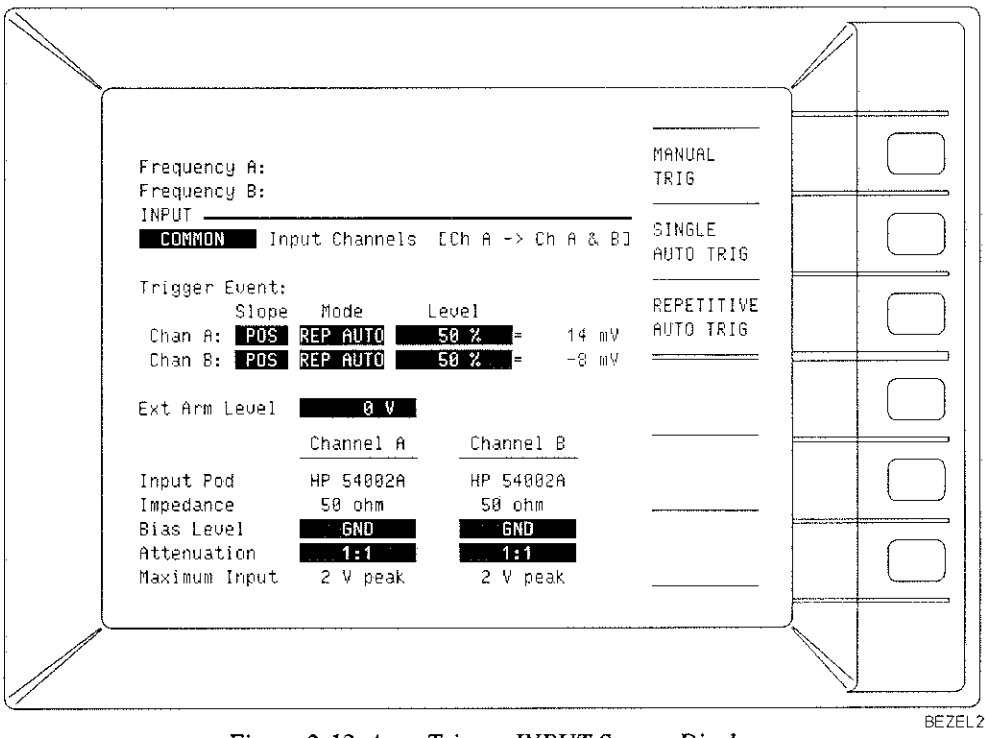


Figure 2-13. Auto Trigger INPUT Screen Display

2-62. HP 8656B SETUP

A. Continue using the setup illustrated in *Figure 2-16B*.

B. Press FREQUENCY, enter "200", and press MHz key.

2-63. Auto Trigger Test Procedure (200 MHz)

A. Press the HP 5371A RESTART key and record the two values displayed on the top of the HP 5371A screen. Both values should be between 199.999 999 80 MHz and 200.000 000 20 MHz.

2-64. HP 3325A SETUP

A. Connect a BNC cable from the HP 5371A rear panel Frequency Standard OUTPUT to the HP 3325A rear-panel EXT REF IN connector. (The HP 3352A's front-panel EXT REF LED should be illuminated.)

B. Press the square wave FUNCTION key.

C. Press AMPTD, enter "200", and press mV key.

D. Connect the HP 5371A Channel A input pod to the SIGNAL output of the HP 3325A using a BNC cable.

2-65. Auto Trigger Test Procedure (1 kHz, 100 kHz, and 10 MHz)

A. Press FREQ on the HP 3325A and enter the frequencies listed in *Table 2-3*. After each frequency is entered, press the HP 5371A RESTART key and record the values displayed on the HP 5371A CRT screen. Both values should lie between the limits specified in *Table 2-3*.

Table 2-3. Auto Trigger Test — Upper and Lower Limits

HP 3325A Frequency	HP 5371A Lower Limit	HP 5371A Upper Limit
1 kHz	999.985 000 0 Hz	1.000 015 000 0 kHz
100 kHz	99.999 985 00 kHz	100.000 015 00 kHz
10 MHz	9.999 999 980 MHz	10.000 000 020 MHz

2-66. Measurement Range Test

Equipment Used: HP 3325A Synthesizer/Function Generator
Test Setup Used: *Figure 2-16A*
HP 5371A Specifications Tested:

Frequency Range: 125 mHz to 500 MHz
Peak Amplitude Range: 200 mV to 2 V(p-p)

NOTE

Frequencies above 1 kHz have been tested in previous tests. Therefore, only frequencies below 1 kHz are tested here.

2-67. HP 5371A SETUP

A. Move the cursor to the "Chan A: Mode" field.

B. Press the MANUAL TRIG softkey.

C. Move the cursor to the "Chan B: Mode" field.

D. Press the MANUAL TRIG softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-14.)*

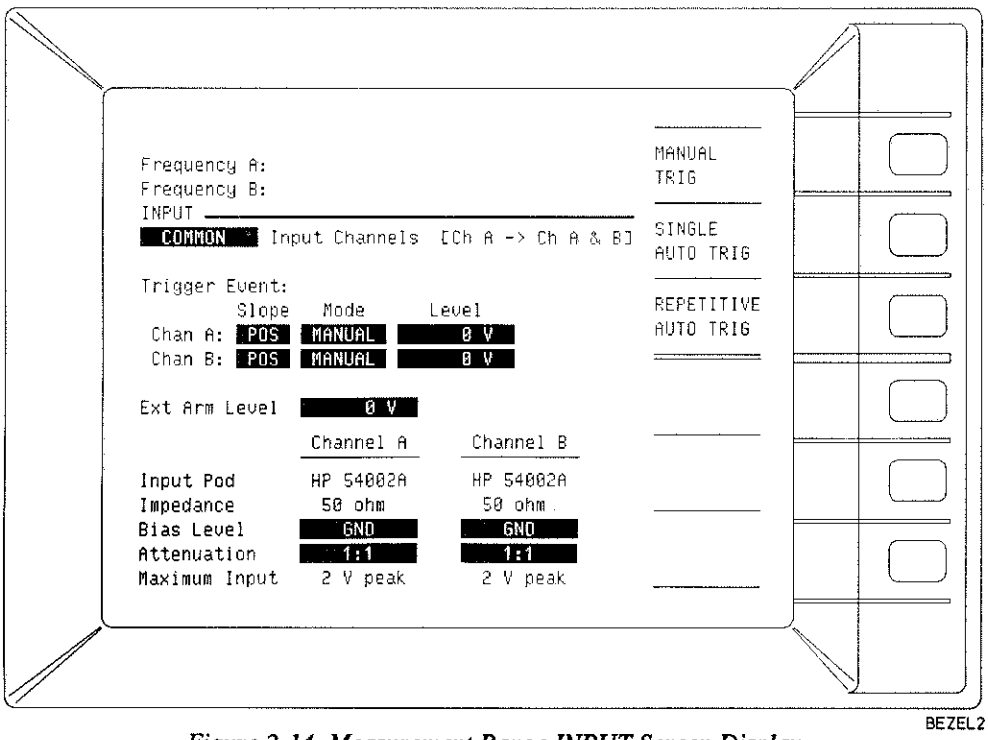


Figure 2-14. Measurement Range INPUT Screen Display

2-68. HP 3325A SETUP

A. If the HP 3325A is still set up as it was for the previous test, the "Auto Trigger Test", proceed to Step D of this procedure. If not, continue with Step B.

B. Connect a BNC cable from the HP 3325A rear panel "EXT REF IN" to the HP 5371A rear panel Frequency Standard OUTPUT. (The HP 3352A's front-panel EXT REF LED should be illuminated.)

C. Press square wave FUNCTION key.

D. Press AMPTD, enter "2", and press VOLT key.

E. Press FREQ, enter "10", and press Hz key.

2-69. MEASUREMENT RANGE TEST PROCEDURE

A. Press the HP 5371A RESTART key and record the value displayed at the top of the HP 5371A display. The value should be between 9.999 500 000 Hz and 10.000 500 000 Hz.

B. On the HP 3325A, press FREQ, enter "0.125", and press Hz key.

C. Move the HP 5371A cursor to "Chan B: Slope" field and press the HP 5371A NEG softkey.

D. Press HP 5371A RESTART key and record the value displayed at the top of the CRT. This value should be between 124.950 000 000 mHz and 125.050 000 000 mHz. This measurement takes approximately 8 seconds.

E. Press the HP 5371A **POS** softkey.

F. Press HP 5371A FUNCTION key.

G. On the HP 5371A:

1. Move the cursor to the "Measurement" field.
2. Press the **More** softkey until **PEAK AMPLITUDE** is a menu selection option.
3. Press the **PEAK AMPLITUDE** softkey.

H. Press HP 3325A FREQ key, enter "10", and press MHz key.

I. Press AMPTD on the HP 3325A and enter the values listed in the left-most column of *Table 2-4.* After each value is entered, press the HP 5371A RESTART key and record the two values displayed at the top of the HP 5371A screen. The values should lie between the limits specified.

Table 2-4. Peak Amplitude — Upper and Lower Test Limits

HP 3325A Amplitude	HP 5371A Maximum Amplitude		HP 5371A Minimum Amplitude	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit
200 mV p-p	80 mV	120 mV	–120 mV	–80 mV
2 V p-p	0.80 V	1.20 V	–1.20 V	–0.80 V

J. Move the HP 5371A cursor to the "Channel" field. Press the B softkey.

K. Press AMPTD key on the HP 3325A and enter the same values listed in *Table 2-4.* After each value is entered, press the HP 5371A RESTART key and record the two results displayed at the top of the HP 5371A display screen. The results should lie between the limits specified.

2-70. Arming and Gating

Equipment Used: HP 8656B Synthesizer/Function Generator
Test Setup Used: *Figure 2-16B*
HP 5371A Specifications Tested:

Event Delay: 4×10^9
Time Delay : 2 ns to 8 s
Gate Timer : 600 ns to 8 s

NOTE

Before performing the Event Holdoff, Time Holdoff, and Gate Timer Procedures for the Channel B input, repeat the "HP 8656B Setup" procedure that follows.

2-71. HP 5371A SETUP

A. Move the cursor to the "Measurement" field.

B. Press the **More** softkey.

C. Press the **FREQUENCY** softkey.

D. Move the cursor to the "Channel" field.

E. Press the **A** softkey. (The HP 5371A front-panel CRT display should appear as in *Figure 2-15.)*

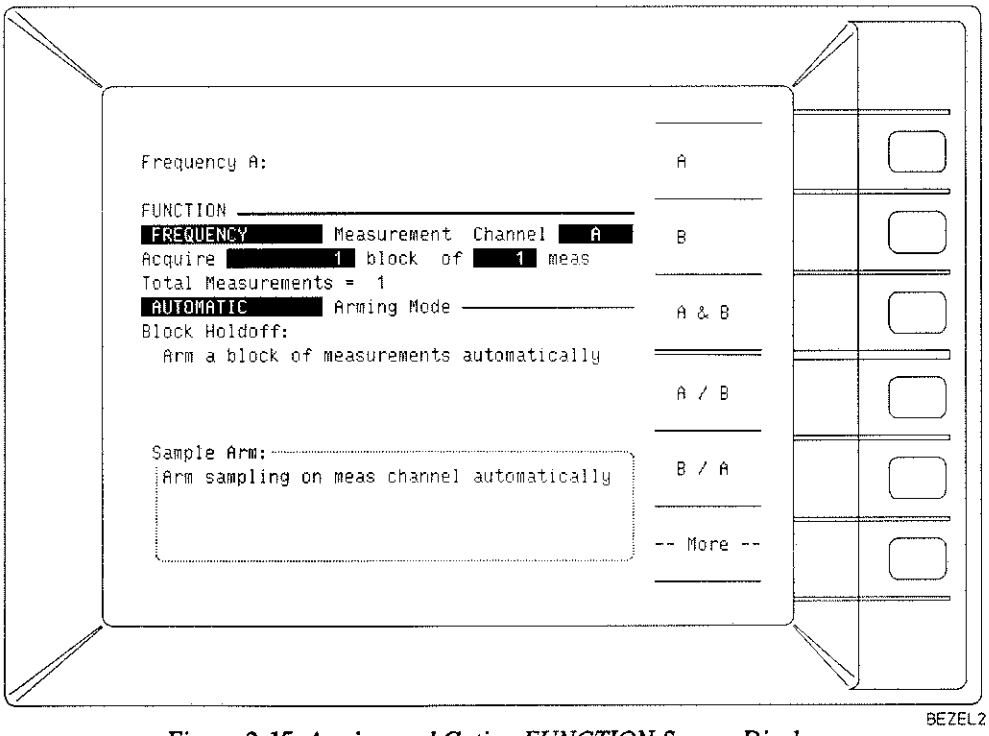


Figure 2-15. Arming and Gating FUNCTION Screen Display

2-72. HP 8656B SETUP

A. Detach the cable from the HP 3325A Signal output and connect it to the HP 8656B RF Output BNC adapter.

B. Press AMPTD key, enter "1", and press V key.

C. Press FREQUENCY key, enter "500", and press MHz key.

2-73. EVENT HOLDOFF PROCEDURE

A. On the HP 5371A:

1. Move the cursor to the "Arming Mode" field.
2. Press the **Hold/Sampl Options** softkey. If **Hold/Sampl Options** softkey is not an option, press the **Return to Main Menu** softkey.
3. Press the **More** softkey until **EVENT/EVENT** softkey is a menu selection option.
4. Press the **EVENT/EVENT** softkey.
5. Move the cursor to the "Start Arm: Count" field.
6. Enter "1" on the numeric keypad if not set already.
7. Press ENTER key if "1" entered in previous step.
8. Move the cursor to the "Stop Arm: Count" field.

9. Enter "4 000 000 000".
10. Press ENTER key.
11. Press RESTART key. This measurement will take approximately 8 seconds to complete.

B. The CRT should display a value between 499.999 999 900 MHz and 500.000 000 10 MHz. Enter this result on the "HP 5371A Performance Test Record".

2-74. TIME HOLDOFF PROCEDURE

A. Press HP 8656B AMPTD key, enter "1", and press V key. Press FREQUENCY key, enter "40", and press MHz key.

B. On the HP 5371A:

1. Move the cursor to the "Arming Mode" field.
2. Press the **More** softkey until **TIME/TIME** softkey is a menu selection option.
3. Press the **TIME/TIME** softkey.
4. Move the cursor to the "Start Arm: Delay" field.
5. Enter "2" on the numeric keypad if not set already.
6. Press the **ns** softkey if "2" entered in previous step.
7. Move the cursor to the "Stop Arm: Delay" field.
8. Enter "8" on the numeric keypad. This sets the time holdoff to 8 seconds.
9. Press ENTER key.
10. Press RESTART key. This measurement will take approximately 8 seconds.

C. The screen should display a value between 39.999 999 900 0 MHz and 40.000 000 100 0 MHz. Enter this result on the "HP 5371A Performance Test Record".

2-75. GATE TIMER PROCEDURE

A. On the HP 5371A:

1. Move the cursor to the "Arming Mode" field.
2. Press the **Return to Main Menu** softkey.
3. Press the **Sampling Options** softkey.
4. Press the **INTERVAL SAMPLING** softkey.
5. Move the cursor to the "intervals" field.
6. Enter "600" on the numeric keypad.
7. Press **ns** softkey.
8. Press RESTART key.

B. The screen should display a value between 39.985 MHz and 40.015 MHz. Enter this value on the "HP 5371A Performance Test Record".

C. On the HP 5371A:

1. Enter "8" on the numeric keypad.
2. Press ENTER key.
3. Press RESTART key.

D. The HP 5371A should display a value between 39.999 999 900 0 MHz and 40.000 000 100 0 MHz. This measurement takes approximately 8 seconds. Enter this value on the "HP 5371A Performance Test Record".

E. Channel B Procedure:

1. On the HP 5371A:
   a. On the HP 5371A: Move the cursor to the "Channel" field.
   b. Press the **B** softkey.
2. Repeat the Event Holdoff, Time Holdoff, and Gate Timer procedures presented above. Set HP 8656B amplitude to 1 Volt and frequency to 500 MHz before beginning Event Holdoff procedure.

2-76. HP 5371A HP-IB Operation Verification Program

The HP-IB Operation Verification Test checks the HP 5371A's ability to transmit or receive HP-IB messages. During this test, the counter's HP-IB data input/output bus, control, and handshake lines are checked. Only the HP 5371A, an HP Series 200 Computer, and applicable HP-IB interface cable are required for the test setup. The validity of the test results is based on the following assumptions:

- The HP 5371A operates correctly from the front panel. This can be verified by performing the "HP 5371A Operation Verification Tests" found earlier in this section.
- The controller being used can properly execute HP-IB commands.

The HP 5371A's device address (primary address) is 03 and may be changed from the front panel through the System menu screen. The address setting applies to both talk and listen functions. For the HP Series 200 Computers the HP-IB interface select code is 7.

NOTE

The device address is retained in non-volatile memory. If the address is not recallable due to a battery or memory failure, a default value of 3 will be selected. The user can not alter the default address.

If all of the checks performed by the program listed in Table 2-5 are successful, the HP 5371A's HP-IB capability can be considered to be performing properly. This program does not check to see if ALL of the counter's program commands are being properly interpreted and executed by the counter. However, if the front panel operation is confirmed to be working properly and its HP-IB capability operates correctly, then there is high probability that the counter will respond properly to all of its program commands.

After successful completion of the HP-IB Operation Verification Test presented in *Table 2-5*, mark "PASS" or "FAIL" on the "HP 5371A Performance Test Record" located at the end of this section.

THE HP 5371A PERFORMANCE TEST IS NOW COMPLETE.

Table 2-5. HP-IB Operation Verification Program

```
10    !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
20    !                               "VERI71A"                                   !
30    !                     hp-ib verification program           3/11/88 M.D.     !
40    !                                                                           !
50    ! Connect the 5371A to a series 200/300 computer with BASIC loaded.         !
60    ! Load and run this program to verify operation of the bus.                 !
70    !                                                                           !
80    !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
90    OPTION BASE 1
100   DIM Result$[25]
110   OUTPUT 2;" K";END
120   ON TIMEOUT 7,5 GOTO To_long
130   DISP "turn 5371A power OFF--press continue when done"
140   PAUSE
150   DISP "connect rear-panel 10MHz output to A channel input--press continue"
160   PAUSE
170   DISP "turn 5371A power ON, wait until FUNCTION screen is displayed";
180   DISP "--press continue"
190   PAUSE
200   DISP "select SYSTEM menu, set address to 3--press continue"
210   PAUSE
220   GOSUB Test1 !self test status
230   GOSUB Test2 !bus integrity
240   GOSUB Test3 !status registers
250   GOSUB Test4 !data transfer
260   DISP "PASSED HP-IB VERIFICATION"
270   OUTPUT 703;"DSP,""PASSED HP-IB VERIFICATION"";LOC"
280   STOP
290 To_long:   !
300            PRINT "HP-IB TIMEOUT, TESTING ABORTED"
310            PRINT "CHECK:"
320            PRINT "     1.CABLES"
330            PRINT "     2.OTHER INSTRUMENTS ON BUS"
340            PRINT "     3.ADDRESS SETTINGS"
350            PRINT "     4.CHECK HP-IB ISC =7  "
360            PRINT "     5.HANDSHAKE SIGNALS WITH BUS ANALYZER"
370            STOP
380 Test1:  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
390   !                                TEST 1                                     !
400   !                           self-test status                                !
410   !5371A must pass self test before continuing this verification             !
420   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
430   Analyzer=703
440   Isc=7
450   OUTPUT Analyzer;"CLE;PRES"
460   OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 1"""
470   DISP "HP-IB VERIFICATION  TEST 1  SELF TEST",
480   OUTPUT Analyzer;"DIAG;TEST,1"
490   DISP "        WAIT 20 SECONDS ..."
500   WAIT 20  !  WAIT FOR SELF-TEST TO COMPLETE
510   OUTPUT Analyzer;"TEST?"
520   WAIT .2
530   ENTER Analyzer;Result$
540   IF Result$=" 0 [ ] No new test data" THEN GOTO 510  !Query again,not ready
550   IF Result$<>" 1 [P] Self Test PASSED" THEN  !  Self Test FAILED
560   PRINT "TEST 1 FAILED, TEST ABORTED"
570   PRINT "' 1 [P] Self Test PASSED' SHOULD BE RETURNED"
580   PRINT "RESULT IS:  ";Result$
590   BEEP
600   STOP
610   END IF
620   PRINT "TEST 1 PASSED"
```

```
630   OUTPUT Analyzer;"STOP;DSP,""TEST 1 PASSED"""
640   BEEP
650   WAIT 1
660   RETURN
670 Test2: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
680   !                          TEST 2                                         !
690   !                       bus integrity                                     !
700   !Ability of the bus to send and receive data is tested.                   !
710   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
720   DIM Send$[200]
730   Analyzer=703
740   Isc=7
750   OUTPUT Analyzer;"CLE;PRES"
760   DISP "HP-IB VERIFICATION     TEST 2"
770   OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 2"""
780   WAIT 2
790   FOR Number=40 TO 127
800   Send$="DSP,"&""""&CHR$(Number )&" TESTING"&""""&";DSP?"
810   OUTPUT Analyzer;Send$
820   WAIT .2
830   ENTER 703;Result$
840   IF Result$<>CHR$(Number )&" TESTING" THEN
850   PRINT "TEST 2 FAILED, TEST ABORTED"
860   OUTPUT Analyzer;"DSP,""TEST 2 FAILED, TEST ABORTED"""
870   PRINT "CHARACTER RETURNED IS ";Result$
880   PRINT "SHOULD BE: ";CHR$(Number )
890   STOP
900   END IF
910   NEXT Number
920   PRINT "TEST 2 PASSED"
930   OUTPUT Analyzer;"DSP,""TEST 2 PASSED"""
940   BEEP
950   WAIT .2
960   BEEP
970   WAIT 1
980   RETURN
990 Test3: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
1000  !                          TEST 3                                         !
1010  !                     status registers                                    !
1020  !The operation of the status registers is verified                        !
1030  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
1040  INTEGER Value,Twopower
1050  Analyzer=703
1060  Isc=7
1070  OUTPUT Analyzer;"CLE;PRES"
1080  DISP "HP-IB VERIFICATION     TEST 3.1"
1090  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.1"""
1100  FOR Value=0 TO 7
1110  Twopower=2^Value
1120  Send$="*ESE,"&VAL$(Twopower )&";*ESE?"
1130  OUTPUT Analyzer;Send$
1140  WAIT .2
1150  ENTER Analyzer;Result
1160  IF Twopower<>Result THEN
1170  PRINT "FAILED TEST 3.1, TEST ABORTED"
1180  OUTPUT Analyzer;"DSP,""FAILED TEST 3.1, TEST ABORTED"
1190  PRINT "RETURNED VALUE OF EVENT STATUS REG IS:"
1200  PRINT Result
1210  PRINT "IT SHOULD BE:"
1220  PRINT Twopower
1230  STOP
1240  END IF
```

Table 2-5. HP-IB Operation Verification Program (Continued)

```
1250  NEXT Value
1260  DISP "HP-IB VERIFICATION     TEST 3.2"
1270  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.2"""
1280  FOR Value=0 TO 9
1290  Twopower=2^Value
1300  Send$="*HSE,"&VAL$(Twopower)&";*HSE?"
1310  OUTPUT Analyzer;Send$
1320  WAIT .2
1330  ENTER Analyzer;Result
1340  IF Result<>Twopower THEN
1350  PRINT "TEST 3.2 FAILED, TEST ABORTED"
1360  OUTPUT Analyzer;"DSP,""TEST 3.2 FAILED, TEST ABORTED"
1370  PRINT "RETURNED VALUE OF H.W. STATUS IS:"
1380  PRINT Result
1390  PRINT "IT SHOULD BE:"
1400  PRINT Twopower
1410  STOP
1420  END IF
1430  NEXT Value
1440  DISP "HP-IB VERIFICATION     TEST 3.3"
1450  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.3"""
1460  OUTPUT Analyzer;"*HSR?"
1470  WAIT .2
1480  ENTER Analyzer;Result
1490  IF Result<>0 THEN
1500  PRINT "TEST 3.3 FAILED, TEST ABORTED"
1510  OUTPUT Analyzer;"DSP,""TEST 3.3 FAILED, TEST ABORTED"""
1520  PRINT "H.W. STATUS REG SHOULD RETURN 0, IT IS: ";Result
1530  STOP
1540  END IF
1550  DISP "HP-IB VERIFICATION     TEST 3.4"
1560  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.4"""
1570  OUTPUT Analyzer;"*ESR?"
1580  WAIT .2
1590  ENTER Analyzer;Result
1600  IF Result<>128 THEN
1610  PRINT "TEST 3.4 FAILED, TEST ABORTED"
1620  OUTPUT Analyzer;"DSP,""TEST 3.4 FAILED, TEST ABORTED"""
1630  PRINT "EVENT STATUS REG. SHOULD RETURN 128, IT IS: ";Result
1640  STOP
1650  END IF
1660  DISP "HP-IB VERIFICATION     TEST 3.5"
1670  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.5"""
1680  OUTPUT Analyzer;"INT;MTV,1;INP;SOUR,A;TRIG,MAN;LEV,2"
1690  WAIT 3
1700  OUTPUT Analyzer;"*HSR?"
1710  WAIT .2
1720  ENTER Analyzer;Result
1730  IF Result<>256 THEN
1740  PRINT "TEST 3.5 FAILED, TEST ABORTED"
1750  OUTPUT Analyzer;"DSP,""TEST 3.5 FAILED, TEST ABORTED"
1760  PRINT "H.W. STATUS REG SHOULD RETURN 256, IT IS: ";Result
1770  STOP
1780  END IF
1790  DISP "HP-IB VERIFICATION     TEST 3.6"
1800  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 3.6"""
1810  OUTPUT Analyzer;"LOC"
1820  OUTPUT Analyzer;"*ESR?"
1830  WAIT .2
1840  ENTER Analyzer;Result
1850  OUTPUT Analyzer;"CLE;PRES"
1860  IF Result<>64 THEN
```

```
1870  PRINT "TEST 3.6 FAILED, TEST ABORTED"
1880  OUTPUT Analyzer;"DSP,""TEST 3.6 FAILED, TEST ABORTED"""
1890  PRINT "EVENT STATUS REGISTER SHOULD RETURN 64, IT IS:";Result
1900  STOP
1910  END IF
1920  PRINT "TEST 3 PASSED"
1930  OUTPUT Analyzer;"DSP,""TEST 3 PASSED"""
1940  BEEP
1950  WAIT .2
1960  BEEP
1970  WAIT .2
1980  BEEP
1990  RETURN
2000 Test4: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
2010  !                        TEST 4                                          !
2020  !                     data transfer                                      !
2030  !Tests the ability of the 5371A to transmit and receive data.            !
2040  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
2050  Isc=7
2060  Analyzer=703
2070  OUTPUT Analyzer;"CLE;PRES"
2080  DISP "HP-IB VERIFICATION     TEST 4"
2090  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION      TEST 4"""
2100  OUTPUT Analyzer;"NUM;DISP,BOLD;MENU,NUM"
2110  OUTPUT Analyzer;"DSP,""HP-IB VERIFICATION     TEST 4"""
2120  OUTPUT Analyzer;"*TRG"
2130  ENTER Analyzer;Read_it
2140  IF Read_it<9.0E-8 OR Read_it>1.10E-7 THEN
2150  PRINT "TEST 5 FAILED, TEST ABORTED"
2160  OUTPUT Analyzer;"DSP,""TEST 4 FAILED, TEST ABORTED"""
2170  PRINT "VALUE RETURNED IS ";Read_it
2180  STOP
2190  END IF
2200  PRINT "TEST 4 PASSED"
2210  WAIT 3
2220  OUTPUT Analyzer;"DSP,""TEST 4 PASSED"";LOC"
2230  FOR J=1 TO 4
2240  BEEP
2250  WAIT .1
2260  NEXT J
2270  RETURN
2280  END
```

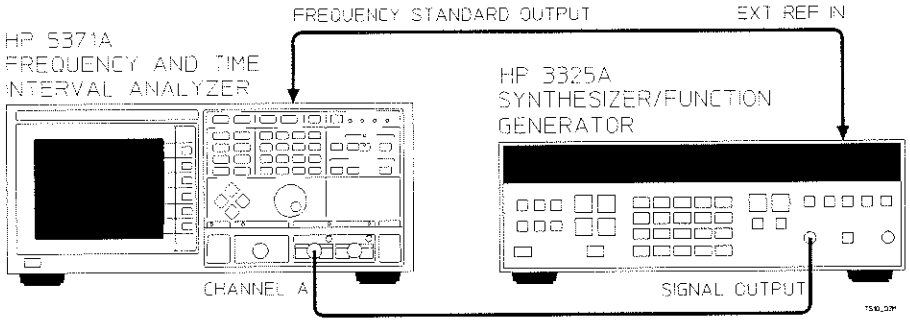


Figure 2-16A. HP 5371A/HP 3325A Test Setup

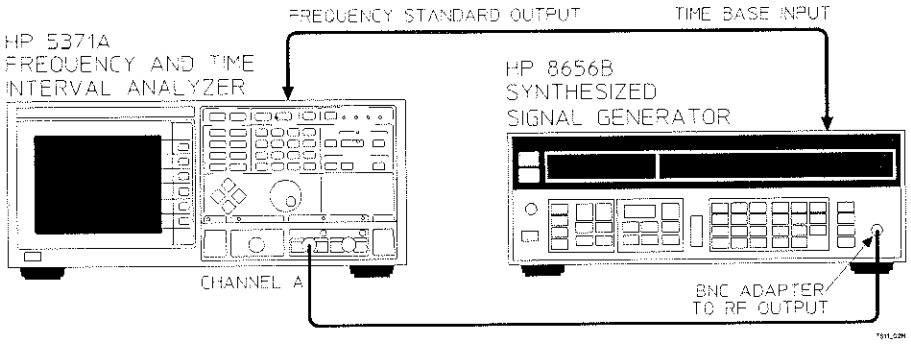


Figure 2-16B. HP 5371A/HP 8656B Test Setup

HP 5371A PERFORMANCE TEST RECORD (Page 1 of 2)

HEWLETT-PACKARD MODEL 5371A
FREQUENCY AND TIME INTERVAL ANALYZER

Repair/Work Order No. _____

Serial Number: _____

Temperature: _____

Test Performed By: _____

Relative Humidity: _____

Date: _____

Post-Calibration Test: ☐

Notes: _____

Pre-Calibration Test: ☐

PARA. NO.	TEST	RESULTS		
2-10	**Operation Verification**	Pass _____		Fail _____
		Minimum	**Actual**	**Maximum**
2-48	**Dynamic Input Range (X1)**			
	45 mV(p-p)			
	FREQ: Chan A	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	9.999 999 980 MHz	_____	10.000 000 020 MHz
	2 V(p-p)			
	FREQ: Chan A	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Operating Range			
	–2 V			
	FREQ: Chan A	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	9.999 999 980 MHz	_____	10.000 000 020 MHz
	+2 V			
	FREQ: Chan A	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	9.999 999 980 MHz	_____	10.000 000 020 MHz
2-52	**Attenuation (X2.5)**			
	5 V(p-p)			
	FREQ: Chan A	9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	9.999 999 980 MHz	_____	10.000 000 020 MHz
2-56	**Sensitivity**			
	Min Pulse Width (1ns)			
	FREQ: Chan A	499.999 985 000 MHz	_____	500.000 015 000 MHz
	Chan B	499.999 985 000 MHz	_____	500.000 015 000 MHz
2-60	**Auto Trigger**			
	FREQ: Chan A	199.999 999 80 MHz	_____	200.000 000 20 MHz
		999.985 000 0 Hz	_____	1.000 015 000 0 kHz
		99.999 985 00 kHz	_____	100.000 015 00 kHz
		9.999 999 980 MHz	_____	10.000 000 020 MHz
	Chan B	199.999 999 80 MHz	_____	200.000 000 20 MHz
		999.985 000 0 Hz	_____	1.000 015 000 0 kHz
		99.999 985 00 kHz	_____	100.000 015 00 kHz
		9.999 999 980 MHz	_____	10.000 000 020 MHz

HP 5371A PERFORMANCE TEST RECORD (Page 2 of 2)

HEWLETT-PACKARD MODEL 5371A
FREQUENCY AND TIME INTERVAL ANALYZER

PARA. NO.	TEST	RESULTS		
		MINIMUM	ACTUAL	MAXIMUM
2-66	**Measurement Range**			
	FREQ: Chan A	9.999 500 000 Hz	_____	10.000 500 000 Hz
		124.950 000 000 mHz	_____	125.050 000 000 mHz
	Chan B	9.999 500 000 Hz	_____	10.000 500 000 Hz
		124.950 000 000 mHz	_____	125.050 000 000 mHz
	Measurement Range			
	Peak Amplitude			
	Chan A Max:	80 mV	_____	120 mV
	Min:	–120 mV	_____	–80 mV
	Max:	0.80 V	_____	1.20 V
	Min:	–1.20 V	_____	–0.80 V
	Chan B Max:	80 mV	_____	120 mV
	Min:	–120 mV	_____	–80 mV
	Max:	0.80 V	_____	1.20 V
	Min:	–1.20 V	_____	–0.80 V
2-70	**Arming and Gating**			
	Chan A:			
	Event Delay	499.999 999 900 MHz	_____	500.000 000 10 MHz
	Time Delay	39.999 999 900 0 MHz	_____	40.000 000 100 0 MHz
	Gate Timer			
	600 ns:	39.985 MHz	_____	40.015 MHz
	8 s:	39.999 999 900 0 MHz	_____	40.000 000 100 0 MHz
	Chan B:			
	Event Delay	499.999 999 900 MHz	_____	500.000 000 10 MHz
	Time Delay	39.999 999 900 0 MHz	_____	40.000 000 100 0 MHz
	Gate Timer			
	600 ns:	39.985 MHz	_____	40.015 MHz
	8 s:	39.999 999 900 0 MHz	_____	40.000 000 100 0 MHz
2-76	**HP-IB Operation Verification Program**		Pass _____	Fail _____

3 ADJUSTMENTS

SECTION 3
ADJUSTMENTS

3-1. INTRODUCTION

This section describes the adjustments required to maintain the HP 5371A within specifications. These adjustments should be performed when required, such as (1) when the instrument fails any of the performance tests, (2) when a component or part that may affect adjustments has been repaired or replaced, (3), for periodic maintenance of the A15 Oven Oscillator, or (4) for visual improvement of the front-panel CRT display.

Except for the power supply adjustment procedures, which should be performed before any repairs are made to the instrument, the order in which the adjustments are performed is not critical. However, the *A2 Input Amplifier Adjustments* must be performed in the order presented.

3-2. SAFETY CONSIDERATIONS

Although this instrument has been designed in accordance with international safety standards, this section contains information, cautions, and warnings which must be followed to ensure safe operation and to retain the instrument in safe condition. Service adjustments should be performed only by a qualified service person.

WARNING

THE AC POWER CIRCUITS TO TRANSFORMER T1, FAN B1, AND THE A12 MOTHERBOARD ARE ALWAYS ENERGIZED WHEN THE INSTRUMENT IS CONNECTED TO AC MAINS REGARDLESS OF THE SETTING OF THE FRONT-PANEL POWER SWITCH (STBY-ON). THE +25 VDC (UNREGULATED) ON THE A12 MOTHERBOARD, THE UNREGULATED DC VOLTAGE TO THE A7 PROCESSOR BOARD (BACK-UP RAMS U50 AND U51, REAL-TIME CLOCK U46), AND THE REGULATED DC VOLTAGE TO THE A15 OVEN OSCILLATOR HEATER ARE ALSO ALWAYS ON WHEN THE AC POWER IS CONNECTED TO THE HP 5371A, EVEN WHEN THE FRONT-PANEL STBY-ON SWITCH IS SET TO STBY. CONTACT WITH ANY OF THESE CIRCUITS CAN RESULT IN PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

WARNING

BEFORE APPLYING POWER TO THE HP 5371A, THE INSTRUMENT AND ALL PROTECTIVE EARTH TERMINALS, EXTENSION CORDS, AUTOTRANSFORMERS, AND DEVICES CONNECTED TO THE INSTRUMENT SHOULD BE CONNECTED TO A PROTECTIVE EARTH GROUNDED SOCKET.

ANY INTERRUPTION OF THE PROTECTIVE GROUNDING CONDUCTOR INSIDE OR OUTSIDE THE INSTRUMENT OR OPENING THE PROTECTIVE EARTH TERMINAL WILL CAUSE A POTENTIAL SHOCK HAZARD THAT COULD RESULT IN PERSONAL INJURY. INTENTIONAL INTERRUPTION IS PROHIBITED.

WARNING

TO PREVENT CATHODE-RAY TUBE (CRT) IMPLOSION, AVOID HANDLING OR JARRING OF THE CRT DISPLAY UNIT. BREAKAGE OF THE CRT CAUSES A HIGH-VELOCITY SCATTERING OF GLASS FRAGMENTS (IMPLOSION). HANDLING THE CRT MUST BE DONE ONLY BY QUALIFIED MAINTENANCE PERSONNEL USING APPROVED SAFETY MASK AND GLOVES.

WARNING

ADJUSTMENTS IN THIS SECTION ARE PERFORMED WITH THE POWER ON AND THE SAFETY COVERS OFF. CONTACT WITH SEVERAL POINTS WITHIN THE INSTRUMENT CAN CAUSE SEVERE INJURY. ADJUSTMENTS SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL WHO ARE AWARE OF THE HAZARDS INVOLVED (FOR EXAMPLE, FIRE AND ELECTRICAL SHOCK).

NOTE

All adjustments should be done with a non-conductive alignment tool.

3-3. ADJUSTMENT LOCATIONS

Adjustment locations are identified in the foldout, *Figure 3-20*, found at the end of this section. Note that all adjustment procedures must be made with the instrument's top cover removed. Adhere to all safety warnings and cautions when performing maintenance with any of the instrument's covers removed.

3-4. EQUIPMENT REQUIRED

The equipment required to perform the adjustment procedures is listed in *Table 3-1, Adjustment Procedure Equipment/Accessory Requirements*. For your convenience, all required test equipment is also listed at the beginning of each individual adjustment procedure.

Table 3-1. Adjustment Procedure Equipment/Accessory Requirements

INSTRUMENT	REQUIRED CHARACTERISTICS	RECOMMENDED MODEL/PART NUMBER
Oscilloscope	1-GHz Bandwidth Channel vs. Channel Display Trigger Delay	HP 54100A
Synthesizer/ Function Generator	125 mHz to 10 MHz Frequency Range 45 mV to 5 V(p-p) Amplitude Range –2.5V to +2.5V DC Offset Range	HP 3325A
Digital Multimeter	100 uV Resolution in True RMS AC 1 MΩ Input Impedance	HP 3455A
Synthesized Signal Generator	1 Hz Resolution at 500 MHz Output 10 dBm Amplitude at 500 MHz Output 50 mV Amplitude at 500 MHz Output	HP 8662A
Universal Frequency Counter	Duty Cycle at 1 kHz Input 0.001 Degree Resolution	HP 5335A

Items Provided in Support Service Kit (HP Part Number 05371-67001)

Item	Qty	Description	HP Part Number
Adapter	1	SMC(f) to BNC(f)	1250-0832
Adapter	1	N(m) to BNC(f)	1250-0780
A19 RF Extender Board	1	A1 Timebase Control Board A2 Input Amplifier Board A4 Interpolator Board	05371-60016
Cable Assembly	3	50Ω CI Phase Cable Assembly	05371-60229
Probe Divider	1	10:1 Probe Divider	10020-67703
Adapter	1	MC-MC RF Adapter	1250-0827

Test equipment other than those specified may be substituted if they meet the specifications used in these adjustments.

3-5. TOOLS REQUIRED

The following tools are also required to perform the adjustment procedures:

- Non-conductive Alignment Tool (Qty 1)
- 8mm Open-end Wrench (Qty 1)
- 6 mm Open-end Wrench (Qty 1)
- Soldering Iron (and accessories)
- BNC Tee-connector (Qty 1)
- HP 10503A 50Ω Cable [120 cm (48 in.) in length] terminated at each end with UG-88C/U BNC connectors (Qty 1).

3-6. ADJUSTMENT PREPARATION

A. Before turning on the HP 5371A, insert two HP 54002 50Ω Input Pods into the front panel slots if these pods are not currently installed.

B. Allow a one hour warm-up period for the HP 5371A and all the other equipment before beginning the adjustments. Turn on all test equipment power switches at this time.

NOTE

If performing the *A15 Oven Oscillator Adjustment* procedure, allow at least a 24-hour warm-up period for the HP 5371A.

C. Remove the top cover (MP25) and the two inner protective metal (MP5 and MP7) covers from the HP 5371A.

Table 3-2 is a list of adjustments procedures and identifies by reference designator the adjustable components involved.

NOTE

Adjustment values may be recorded on the "HP 5371A Adjustment Record" provided at the end of this section.

Table 3-2. HP 5371A Adjustments

ASSEMBLY NAME	ADJUSTABLE COMPONENT REFERENCE DESIGNATOR	ADJUSTMENT DESCRIPTION
A9 Double Regulator	A9R14 A9R24	−5.2 Volt Power Supply −3.3 Volt Power Supply
A10 Triple Regulator	A10R4 A10R3	−15 Volt Power Supply +15 Volt Power Supply
A15 Oven Oscillator	A15C1	10 MHz Oscillator Frequency
A4 Interpolator	 R6, R19, R20, R24, R27, R31, R35, R38, R41, and R46 R60, R73, R74, R76, R78, R80, R82, R85, R92, and R97 A4 Delay Jumpers	Interpolator Resolution Interpolator 1 (Start) Interpolator 2 (Stop) Interpolator CI Phase
A5 ZDT/Count	R602, R603, R606	VCS Adjust for U22, U30, and U28
A2 Input Amplifier	A2R3 A2R1 A2R4 A2R2 A2R10 A2R12 A2R11 A2R13 A2R10 A2R11 A2R12 A2R13 A2R14 A2R15	Channel A Input Bias Loop Channel B Input Bias Loop Channel A DC Offset Channel B DC Offset Channel A Hysteresis Offset Channel A Hysteresis Width Channel B Hysteresis Offset Channel B Hysteresis Width Channel A DC Offset Refinement Channel B DC Offset Refinement Channel A Hysteresis Refinement Channel B Hysteresis Refinement Channel A DC Offset Control Gain Channel B DC Offset Control Gain
A17 CRT & Driver Board	A17 Pots	CRT Display

3-7. ADJUSTMENT PROCEDURES

3-8. A9 Double and A10 Triple Regulator Adjustments

Description: This procedure adjusts the –5.2V, –3.3V, and ±15V supply voltages to values specified in Table 3-3.

Equipment Used: HP 3455A Digital Multimeter

Test Setup: See *Figure 3-1.*

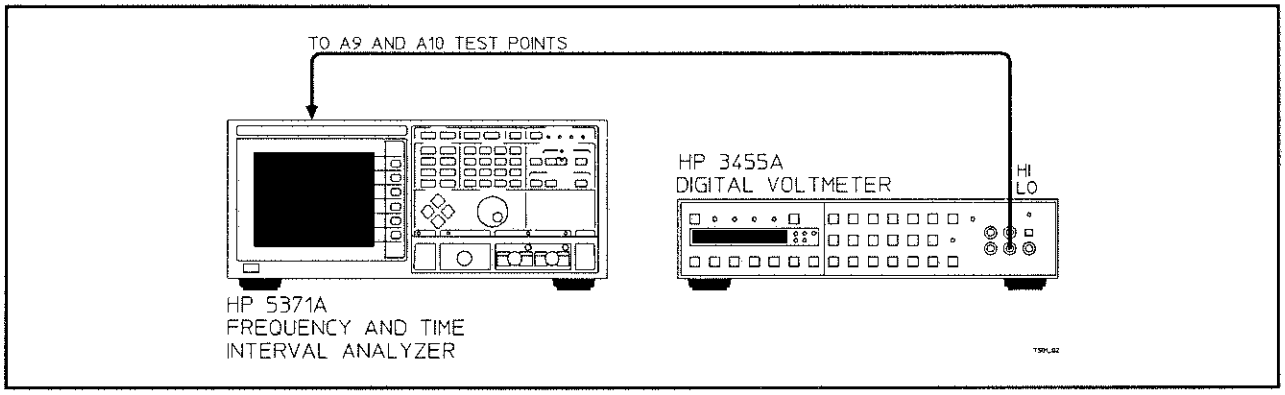


Figure 3-1. A9 and A10 Power Supply Adjustment Setup

3-9. HP 3455A Digital Multimeter

A. Press the DC Volts and AUTO keys.

B. Attach test probe leads to the VOLTS (HI) and COM (LO) inputs.

C. Connect the COM (LO) probe to either the A9 Double Regulator or A10 Triple Regulator Board GND test points located at the top edge of either board. See *Figures 3-20C* and *3-20D.*

3-10. Power Supply Adjustment Procedure

A. Connect the HI test probe to the test points specified in *Table 3-3*, located at the top edge of either A9 Double Regulator or A10 Triple Regulator Board. Adjust the appropriate potentiometers until the voltage is within the ranges specified in *Table 3-3.*

Table 3-3. Powr Supply Adjustment Limits

ASSEMBLY	TEST POINT	POTENTIOMETER	ADJUSTMENT RANGE
A9	–5.2 V	A9R14	–5.21V to –5.19V
A9	–3.3 V	A9R24	–3.29V to –3.27V

B. Attach the test lead to the A10 Triple Regulator +5V test point and verify that the voltage is between +4.8 V dc and +5.2 V dc. If not, replace the A10 with a new assembly.

WARNING

REPLACE POWER SUPPLY COVER AFTER SATISFACTORY COMPLETION OF THE POWER SUPPLY ADJUSTMENTS. WITH THE POWER ON AND THIS COVER REMOVED, DANGEROUSLY HIGH VOLTAGES ARE PRESENT IN THE AREA OF THE CATHODE RAY TUBE (CRT) AND THE CRT DRIVER BOARD. KEEP COVER IN PLACE WHEN AT ALL POSSIBLE. POWER SHOULD BE OFF DURING COVER INSTALLATION.

3-11. A15 Oven Oscillator Adjustment

Description: *This procedure describes the adjustment of the internal 10 MHz Oven Oscillator to within specifications.*

Equipment Used: HP 1725A Oscilloscope
House Standard Frequency (1,2,5, or 10 MHz)

Test Setup: See *Figure 3-2.*

NOTE

The A15 Oven Oscillator requires a 24 hour warm-up period prior to performing this adjustment.

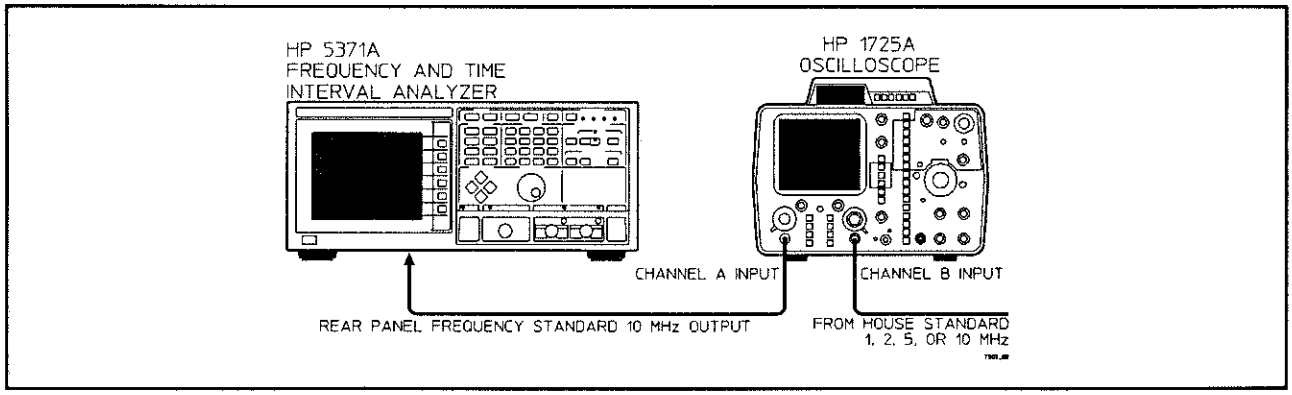


Figure 3-2. A15 Oven Oscillator Adjustment Setup

3-12. HP 1725A Oscilloscope Setup

A. Set Channel A vertical input termination to 50Ω.

B. Set the Channel A vertical sensitivity to 0.5 Volt/division.

C. Set the horizontal sensitivity to 10 ns/division.

D. Connect a 50Ω BNC cable from Channel A of the oscilloscope to the FREQUENCY STANDARD OUTPUT located at the rear panel of the HP 5371A.

E. Set VERT DISPLAY to A and MAIN TRIGGERING to EXT.

F. Using a 50Ω BNC cable, connect a house standard (1, 2, 5, or 10 MHz reference frequency) to EXT TRIG of the oscilloscope.

3-13. A15 Oven Oscillator Adjustment Procedure

A. Remove the 5371A top cover and locate the adjustment, A15C1, located on top of the A15 Oven Oscillator (see *Figure 3-20E*).

B. Adjust A15C1 (see *Figure 3-20E*) until the horizontal movement of the signal on the oscilloscope display is minimized or stopped. Increase the horizontal resolution of the oscilloscope for greater accuracy.

C. By timing the horizontal movement (in cm/second) of the signal on the oscilloscope display with a stop watch, the approximate offset can be determined based on oscilloscope sweep speed. For example, if the trace moves 5 cm in 10 seconds and the sweep speed is 0.01 μs/div, the A15 Oven Oscillator's output is within 5×10^{-9} of the house standard reference frequency.

$$\text{Offset} = \frac{\text{movement in cm}}{\text{time in seconds for movement}} \times \text{(sweep speed in seconds/division)}$$

For example, a sweep speed of 0.1 μs/div and a drift of 1 cm/sec would result in an offset of

$$\text{Offset} = \frac{1 \text{ cm}}{\text{seconds}} \times 0.1 \text{ μs/div} = 1 \times 10^{-7}$$

D. Determine the offset using the above formula. The offset must be less than 5×10^{-10}. This means that using a sweep speed of 0.01 μs/div and observing the movement for 10 seconds, the drift must be less than 0.5 cm. The A15 Oven Oscillator adjustment is now complete.

3-14. A4 Interpolator Board Adjustment

3-15. INTERPOLATOR RESOLUTION ADJUSTMENT

Description: *This procedure adjusts the Interpolator 1 (Start) and Interp Interpolator 2 (Stop) resolution. This is accomplished by adjusting the IT1 and IT2 delay of each "flash interpolation" flip-flop to exactly 200 ps.*

Equipment Used: HP 8662A Synthesized Signal Generator
05371-60016 Extender Board
HP Part Number 1250-0832 SMC(f)-to-BNC(f) Adapter
HP Part Number 1250-0780 N(m)-to-BNC(f) Adapter

Test Setup: *See Figure 3-3.*

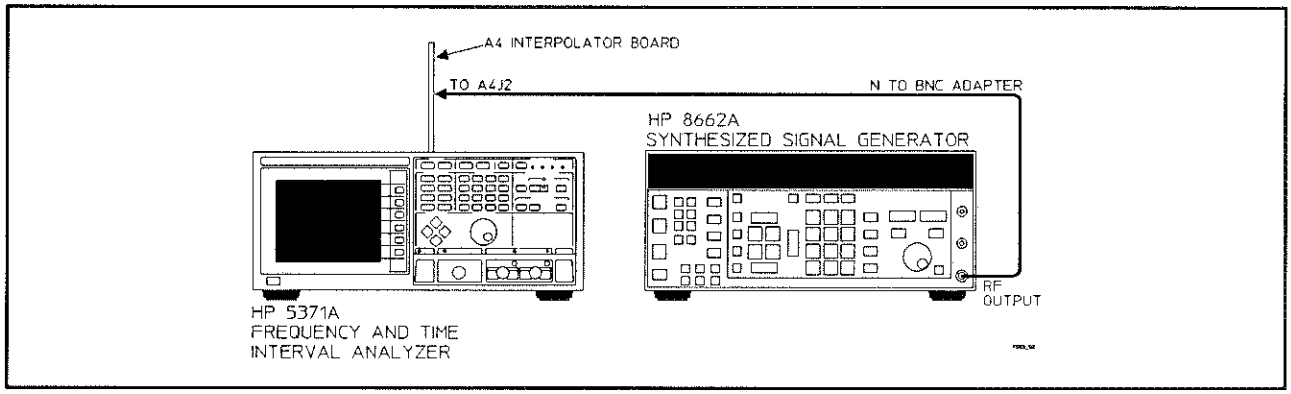


Figure 3-3. A4 Interpolator Resolution Adjustment Setup

3-16. HP 8662A Synthesized Signal Generator Setup

A. Press FREQ key, enter "499.983 333", and press MHz key.

B. Press AMPTD key, enter "10", and press dBm key.

C. Connect the N-to-BNC adapter to the RF OUTPUT connector.

D. Connect a BNC cable to the N-to-BNC adapter.

E. Connect the BNC-to-SMC adapter to the other end of the BNC cable.

F. Connect a BNC cable from the rear panel 10 MHz of the HP 8662A to the Channel A input pod of the HP 5371A.

CAUTION

DO NOT ALLOW THE CASING OF ANY SMC CONNECTORS TO CONTACT PINS OR CONDUCTORS EXPOSED DURING THIS PROCEDURE. THIS CAN LEAD TO A SHORT CIRCUIT CAUSING DAMAGE TO THE HP 5371A.

A. Turn the front-panel STBY-ON power switch from ON to STBY.

B. Unscrew the SMC cable from the A4 Interpolator Board. Do not reconnect.

C. Remove the A4 Interpolator Board from its slot in the A12 Motherboard.

D. Insert the 05371-60016 Extender Board in the A4 card guide and insert in the A12 Motherboard connector.

E. Insert the A4 Interpolator Board into the Extender Board.

F. Connect the cable from the HP 8662A to the A4 Interpolator Board.

G. Turn the front-panel STBY-ON power switch from STBY to ON.

H. Press TEST key.

I. Move the cursor to Test 21, "Calibrate Interps".

J. Press the **Run** softkey.

K. The screen should display a staircase pattern as shown in *Figure 3-4.* A potentiometer is specified at each of the nine transition bands. Each potentiometer controls the steps on both sides of the transition band.

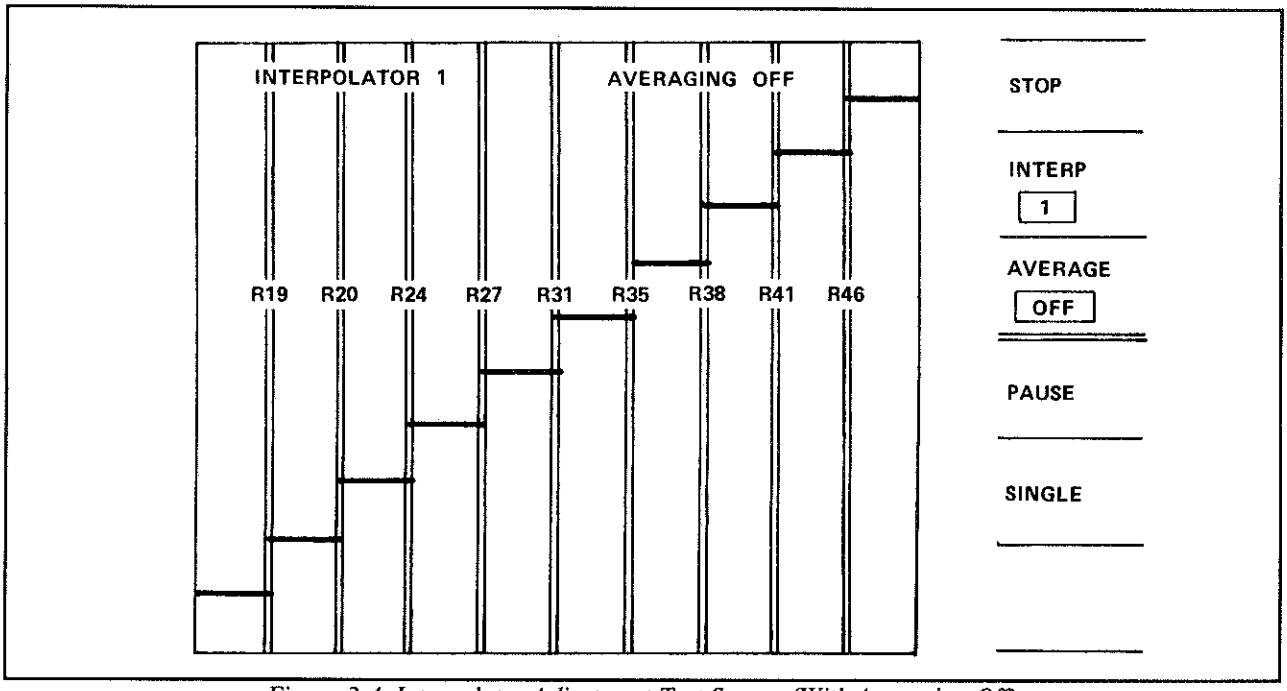


Figure 3-4. Interpolator Adjustment Test Screen (With Averaging Off)

3-18. Interpolator 1 (Start) Adjustment Procedure

NOTE

See *Figure 3-20B* for component locations.

A. A4R6 controls the CI to IT phase for the Interpolator I (Start). Adjust A4R6 to make the first and last steps of the staircase about the same width.

B. Adjust the following Interpolator 1 (Start) potentiometers to make all the steps of the staircase about the same length. The step transition points should fall in the indicated bands shown on the display.

A4: R19 R20 R24 R27 R31 R35 R38 R41 R46 (and R6 if necessary)

C. Press the **AVERAGE OFF** softkey. (Sets to **AVERAGE ON**.)

D. Define the adjustments made in Step B by adjusting the same potentiometers to move all the steps completely into the inner horizontal band, which is designated by the two solid horizontal lines. The steps may randomly extend outside this inner horizontal band, but should not extend far outside the outer horizontal band, which is designated by the two dotted horizontal lines.

HINT No. 1

Each pot controls two steps. Adjust A4R6 to first level the steps at the edge of the screen. Then adjust the pots stated above. Adjust A4R19 to get the left most step into the band, even though this may put the second leftmost step out of the band. Then adjust A4R20 to put the second leftmost step into the band even though this may put the thirdmost step out of the band. Continue this until all the steps are into the band.

3-19. Interpolator 2 (Stop) Procedure

A. Press the **AVERAGE ON** softkey. (Sets to **AVERAGE OFF**.)

B. Press the Interpolator 2 (Stop) (**Interp 1**) softkey. (Sets to **Interp 2**.)

C. A4R60 controls the CI to IT phase for the Interpolator 2 (Stop). Adjust A4R60 to make the first and last steps of the staircase about the same width.

D. Adjust the following Interpolator 2 (Stop) potentiometers to make all the steps of the staircase about the same length. The step transition points should fall in the indicated bands shown on the display.

A4: R73 R74 R76 R78 R80 R82 R85 R92 R97 (and R60 if necessary)

E. Press the **AVERAGE OFF** softkey. (Sets to **AVERAGE ON**.)

F. Refine the adjustments made in Step D by adjusting the same potentiometers to move all the steps completely into the inner horizontal band, which is designated by the two solid horizontal lines. The steps may randomly extend outside this inner horizontal band, but should never extend outside the outer horizontal band, which is designated by the two dotted horizontal lines.

HINT No. 2

Use the same technique as defined in Hint No. 1

G. Press the **STOP** softkey.

H. Disconnect the SMC cable from the A4. Remove the A4 assembly from the extender board. Remove the extender board from the A4 slot in the A12 Motherboard.

I. Insert the A4 Interpolator Board into its A12 Motherboard slot. Reconnect the SMC Clock cable to the A4 Interpolator Board.

3-20. INTERPOLATOR CI-to-CLKA PHASE ADJUSTMENT

Description: *This adjustment allows the phase relationship between the CI edge, which is used as the latch signal for the Timing Counter Chain ZDTs, and the next 500 MHz reference frequency (CLKA) edge to be set. This ensures that when the CI edge arrives at the ZDT, the next clock edge will increment the counter and the new counter value will be latched and stored in Measurement RAM. The chance that the wrong count value is stored in memory or that a clock edge is missed, is eliminated.*

NOTE

Perform this adjustment ONLY after replacing any A4 assembly component parts or replacement of the entire A4 assembly.

Equipment Used: HP 54100-series Digitizing Oscilloscope

3 each BNC(m)-to-SMC(f) 50Ω Cables
(HP Part Number 05371-60229)

Test Probe, 10:1, 500Ω with SMC(m) connector
(HP Part Number 10020-67703)

Adapter, SMC(m) to SMC(m) to SMC(m) tee
(HP Part Number 1250-0837)

Adapter, SMC(m) to SMC(m) straight (HP Part Number 1250-0827)
Soldering Iron

Extender Card
(HP Part Number 05371-60016)

3-21. HP 54100A Oscilloscope Setup

CAUTION

DO NOT REPLACE AN INPUT POD WHILE THE 5371A IS ENERGIZED. ALWAYS SET ANALYZER'S FRONT-PANEL STBY-ON POWER SWITCH TO STBY BEFORE REMOVING OR INSERTING A 54001A, 54002A, OR 54003A INPUT POD. DAMAGE TO THE POD CAN RESULT FROM NOT FOLLOWING THIS PROCEDURE.

NOTE

Allow the 54100A at least 20 minutes to warmup before proceeding with this procedure.

A. Install 50Ω input pods (HP 54002A) for both channel 1 and channel 2 inputs of the 54100A.

B. Attach a BNC(m)-to-SMC(f) 50Ω cable (HP Part Number 05371-60229) to the 54100A channel 1 input.

C. Attach a BNC(m)-to-SMC(f) 50Ω cable (HP Part Number 05371-60229) to the 54100A channel 2 input.

D. Attach a BNC(m)-to-SMC(f) 50Ω cable (HP Part Number 05371-60229) to the 5371A rear-panel 10 MHz FREQUENCY STANDARD OUTPUT.

E. Attach the opposite ends of all three cables to the SMC tee adapter. The 10 MHz frequency from the 5371A rear panel is sent to both oscilloscope channels and is used to calibrate out any offsets caused by cable lengths.

F. Press AUTO-SCALE key.

G. Set Offset and Triggering as follows:

1. Set Channel 1 Offset to 0.
2. Set Channel 2 Offset to 0.
3. Set Channel 1 Trigger Level to 0.
4. Set Channel 2 Trigger Level to 0.

H. Press **More** softkey at bottom of CRT display.

I. Press **Display** softkey at bottom of CRT display.

1. Set Display Mode to "Averaged".
2. Set NUMBER OF AVERAGES to "16".
3. Set Split Screen to "Off".

J. Press **More** softkey at bottom of CRT display.

K. Press **Utility** softkey at bottom of CRT display.

L. Press **Cal Menu** softkey at right of CRT display.

M. Press **TRIG DELAY Chan 1** softkey at the right of CRT display.

N. Press **Expand Waveform** softkey at right of CRT display until a resolution of 500 ps/div is reached.

O. Rotate the 54100A RPG (rotary knob) until rising edge of channel 1 input signal crosses the X-axis at the grid origin. See *Figure 3-5.*

P. Press the **TRIG DELAY Chan 1** softkey at right of CRT display. **SKEW Ch to Ch** should replace **TRIG DELAY Chan 1** softkey display.

Q. Press **Expand Waveform** softkey at right of CRT display until a resolution of 500 ps/div is reached.

R. Rotate the 54100A RPG (rotary knob) to adjust skew. Continue adjusting until the rising edge of channel 2 input signal also crosses the X-axis at the grid origin. *This zeroes the skew that existed between the input channels of the 54100A Oscilloscope.* See *Figure 3-6.*

S. Press the **TRIG DELAY Chan 2** softkey at right of CRT display. Channel 2 should replace.

T. Press **Expand Waveform** softkey at right of CRT display until a resolution of 500 ps/div is obtained.

U. Rotate the 54100A RPG (rotary knob) until the rising edge of channel 2 input signal corsses the x-axis at the grid origin.

V. Press **Exit Cal Menu** softkey at the right of CRT display.

W. Adjust the 54100A Oscilloscope to the following settings:

Display Softkey
- Display Mode: # Averaged = 16
- Split Screen: Off
- Graticle: Grid

Timebse Softkey
- SEC/DIV: 500 ps/div
- Delay Ref at Center
  - Delay: 0

Chan 1 Softkey
- VOLTS/DIV: 100 mV/div
- Chan 1 Display: On
- Offset: 0.000 V

Probes Softkey
- Chan 1 PROBE ATTEN: 1.000
- Chan 2 PROBE ATTEN: 10.00

Chan 2 Softkey
- VOLTS/DIV: 100 mV/div
- Chan 2 Display: On
- Offset: –1.200 V

Trigger Softkey
- Trigger Mode: Edge
- Trig Src: Chan 2
- Slope: Positive
- Trig Level: –1.2V

X. Disconnect all BNC(m)-to-SMC(f) 50Ω cables from the SMC tee adapter.

Y. Connect the SMC(m)-to-SMC(m) adapter to the channel 1 input cable.

Z. Connect the 10:1 500Ω probe (HP Part Number 10020-67703) to the channel 2 input cable.

AA. Disconnect the cable connected to the 5371A rear panel.

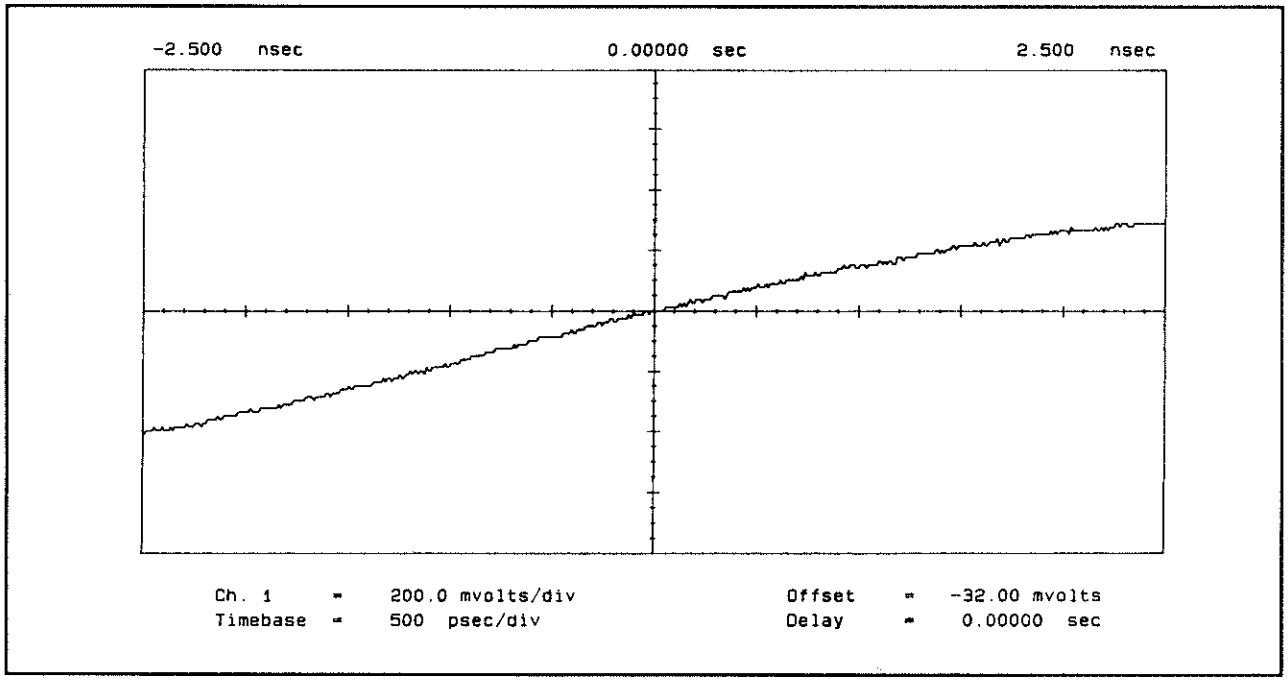


Figure 3-5. Channel 1 Signal Positioning on 54100A CRT Display

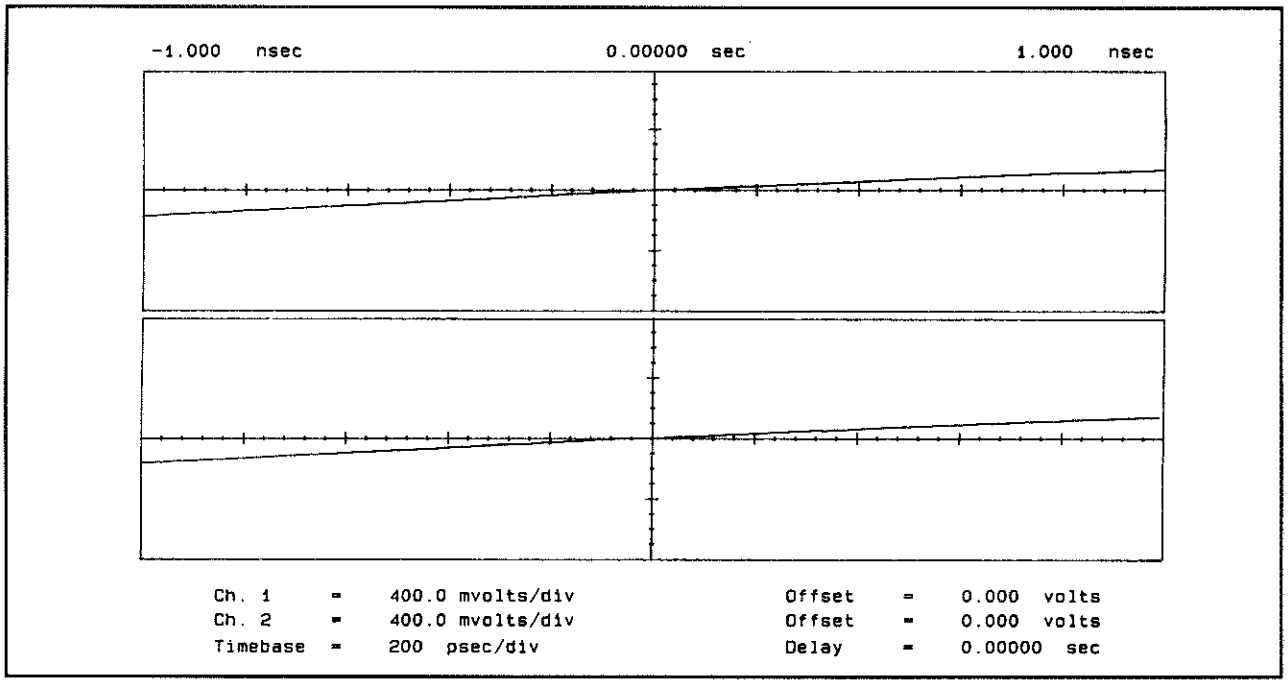


Figure 3-6 Zero Skew Between Channel 1 & 2 Waveform

3-22. HP 5371A Frequency and Time Interval Analyzer Setup

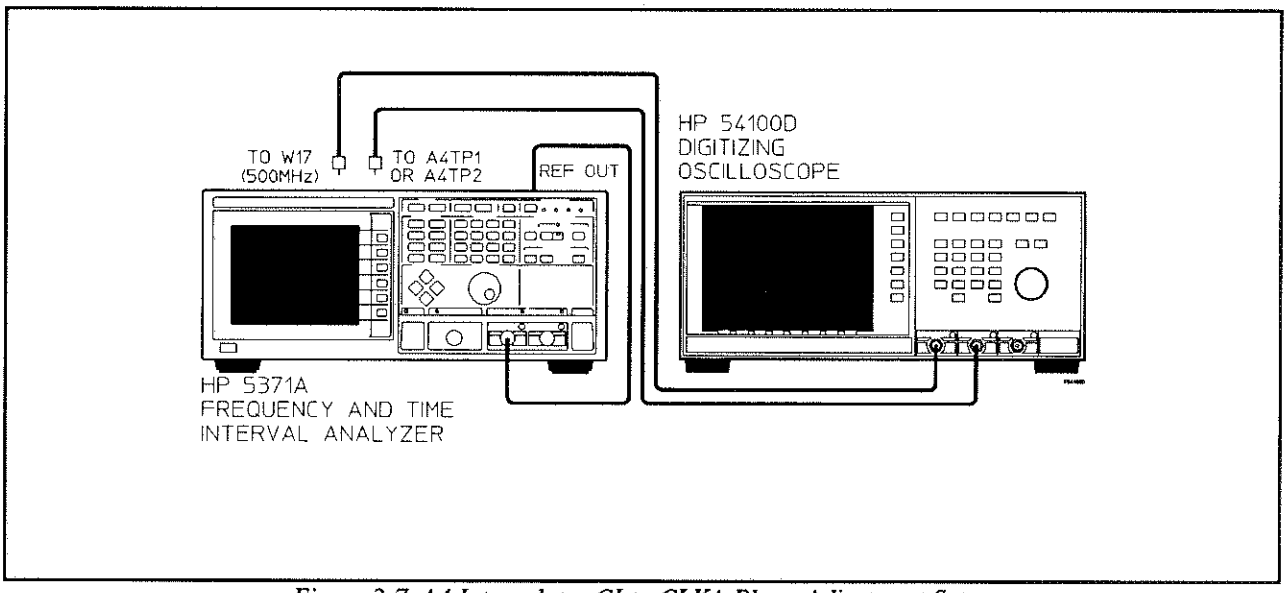


Figure 3-7. A4 Interpolator CI-to-CLKA Phase Adjustment Setup

CAUTION

DO NOT ALLOW THE CASING OF ANY SMC CONNECTORS TO CONTACT PINS OR CONDUCTORS EXPOSED DURING THIS PROCEDURE. THIS CAN LEAD TO A SHORT CIRCUIT CAUSING DAMAGE TO THE HP 5371A. USE PAPER TO KEEP THESE CONNECTORS ISOLATED.

A. Turn the front-panel STBY-ON power switch from ON to STBY.

B. Remove SMC cable, W16, from A4J2 of the A4 Interpolator Board. (This cable routes the 500 MHz reference frequency, CLKA, to the A4.)

C. Remove the A4 Interpolator Board from the instrument.

D. Remove SMC cable, W17, from A5J3 of the A5 ZDT/Count Board. This cable is located toward the rear of the A5 assembly. Connect W17 cable to the adapter on the 54100A Oscilloscope channel 1 input cable.

E. Place the A19 RF Extender Board in the XA4 slot on the A12 Motherboard.

F. Insert the A4 assembly into the extender board.

G. Remove extender board cable, A19W3, from A19J4 and connect it to A4J2 on the A4 assembly.

H. Connect W16 to A19J4.

I. Remove ribbon cable, W6, from connectors A5J2 and A6J1 of the A5 ZDT/Count and A6 DMA/Gate Boards respectively. For later versions of the A6 assembly, moving A6J3 jumper from NORMAL (left-most position) to SERVICE (right-most position) accomplishes the same thing: places the count hardware in a "free-run" mode.

J. Turn the 5371A STBY-ON power switch to ON.

NOTE

Power-up Self Testing will indicate failures with the count hardware (i.e., ZDT ICs, Measurement RAM, etc.).

K. Connect the 10:1 500Ω probe (HP Part Number 10020-67703) from 54100A channel 2 input cable to A4TP1 (CI1).

L. Press PRESET key.

M. Press INPUT key.

N. Move the cursor to the "Chan A: Mode" field.

O. Press the **Manual Trig** softkey. Set the trigger level to 0 Volts if not set already.

P. Connect a BNC cable from the 5371A rear-panel FREQUENCY STANDARD 10 MHz OUTPUT signal to the 5371A CHANNEL A input pod.

3-23. Interpolator 1 (Start) CI1-to-CLKA Phase Adjustment Procedure

A. The 54100A Oscilloscope displays the 500 MHz reference frequency (CLKA) on input channel 1, and the CI1 leading edge on input channel 2. The oscilloscope display should now be similar to *Figure 3-8*.

NOTE

The 54100A Oscilloscope is used to determine the time between the rising edge of the CI1 signal and the next rising edge of the 500 MHz reference frequency, CLKA. This is accomplished by selecting the **Delta t** softkey on the oscilloscope.

B. Press **Delta t** softkey at the bottom of 54100A CRT display.

1. Set Tmarkers to On.

C. Using the 54100A's rotary knob, set the START MARKER on the rising of 500 MHz reference frequency (CLKA) on channel 1 at 0 Volts.

D. Using the 54100's rotary knob, set the STOP MARKER on the rising edge of CI1 signal on channel 2 at –1.3 Volts. (The STOP MARKER must be place to the right of the START MARKER.) See *Figure 3-8*.

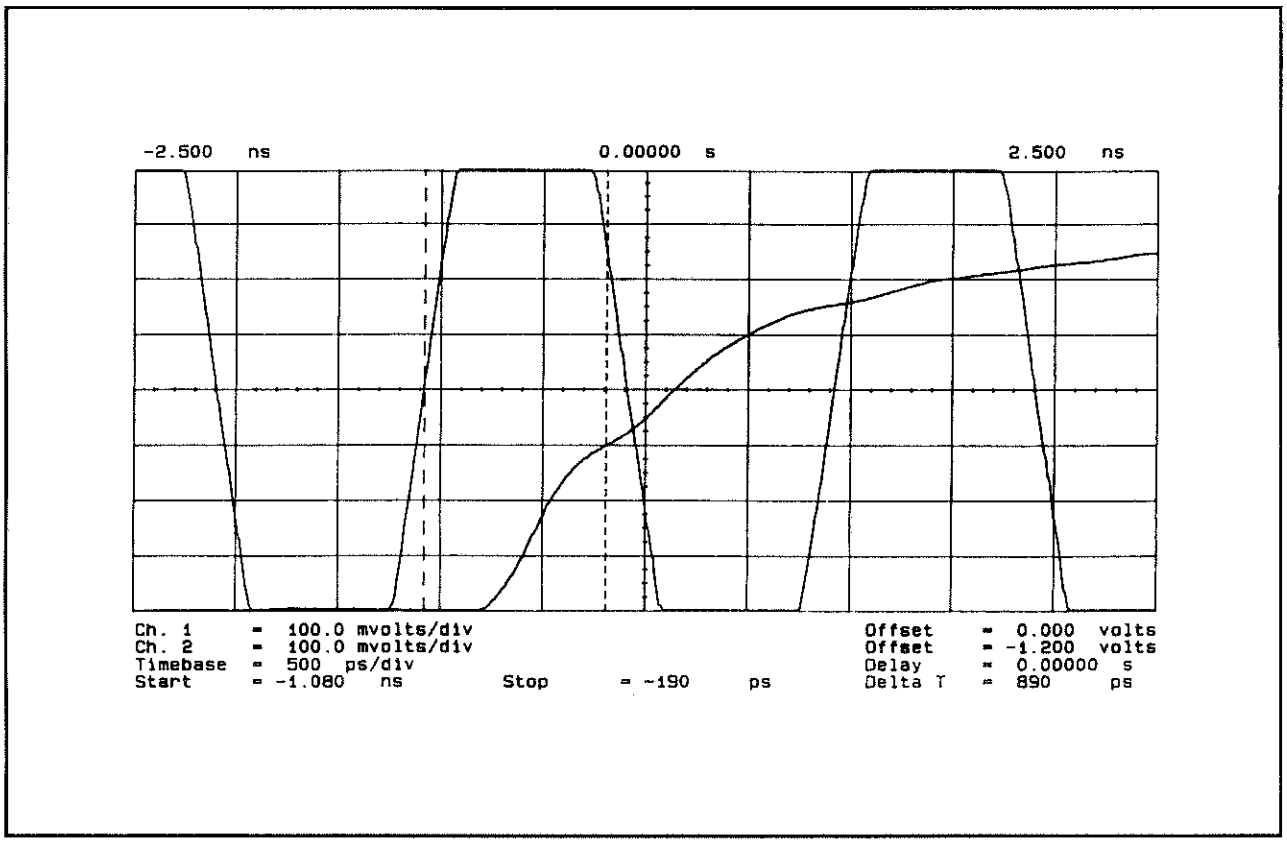


Figure 3-8. Oscilloscope Display of CI1 and CLKA

E. Read "Delta t" displayed in the lower right-hand corner of the 54100A CRT display and refer *Table 3-4* to determine if this CI1-to-CLKA delay is within limits. If Interpolator 1 (Start) delay is within limits, proceed to the Interpolator 2 (Stop) phase adjustment procedure. If Δt is between 200 ps to 1400 ps, no change is required, skip to 3-24A. If not, see *Table 3-4* and continue.

Table 3-4. CI-to-CLKA Phase Adjustment

Measured Time Delay Between CI1 or CI2 500 MHz Reference(CLKA)	Current Configuration	Configuration Required	Description
1400 ps<Measured<1800 ps Time	2 3	1 2	Delay too long.
200 ps<Measured<1400 ps Time	1,2,3	No change is necessary.	Delay is correct.
-200 ps<Measured<200 ps Time	1 2	2 3	Delay too short

F. Turn 5371A STBY-ON power switch to STBY.

G. Remove SMC cable and test probe from TP1 of the A4 Interpolator Board. Remove the A4 Interpolator Board from the extender board.

H. Locate Interpolator 1 (Start) delay jumpers W1-W5 by referring to *Figure 3-9.*

I. Refer to the actual A4 Interpolator Board and *Figure 3-9* to determine which delay configuration currently exists in the Interpolator 1 (Start) circuit.

J. Desolder and remove the 0Ω resistor(s) (i.e., delay jumpers W1-W5) used for the current delay configuration. Solder the required delay configuration using 0Ω resistors as delay jumpers.

K. Return the A4 Interpolator Board into the extender board already inserted into slot XA4 of the A12 Motherboard. Reconnect the SMC cable to the A4 Interpolator Board. Insert the test probe into A4TP1. Turn on the HP 5371A.

L. Turn 5371A STBY-ON power switch to ON.

M. The 54100A Oscilloscope should again display the CI1 and 500 MHz reference frequency (CLKA) signals as shown in *Figure 3-8*. Adjust the oscilloscope delay to center the CI1 edge. Return to Step B.

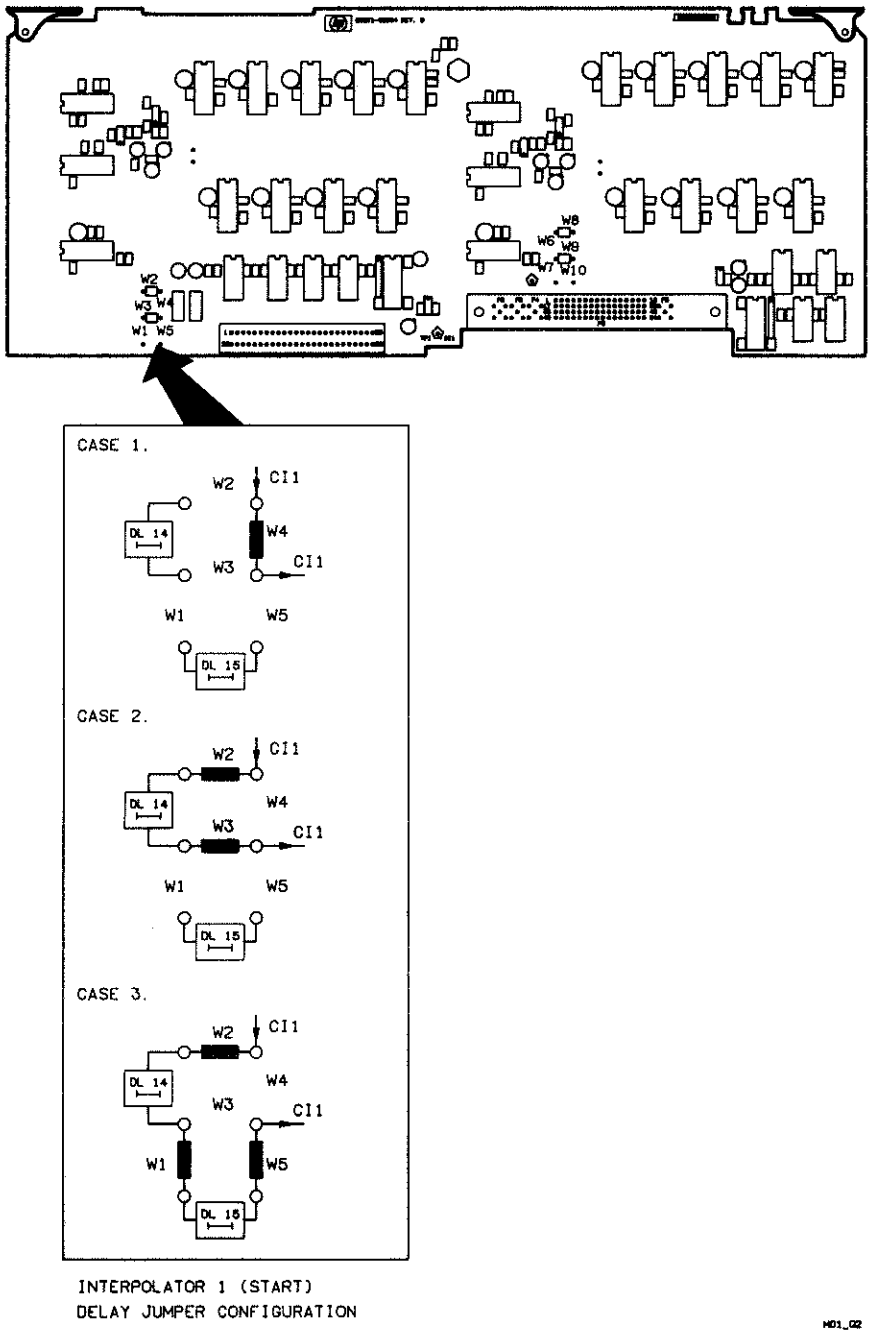


Figure 3-9. Interpolator 1 (Start) Delay Configurations

3-24. Interpolator 2 (Stop) CI2-to-CLKA Phase Adjustment Procedure

A. Remove the oscilloscope probe from A4TP1 (CI1) and attach it to A4TP2 (CI2) (see *Figure 3-20B*).

B. The 54100A Oscilloscope displays the 500 MHz reference frequency (CLKA) on input channel 1, and the CI2 leading edge on input channel 2. The oscilloscope display should now be similar to *Figure 3-10*.

C. Press **Timebse** softkey at the bottom of 54100A CRT display.

1. Set SEC/DIV, or Sweep Speed, to 500 ps/div.
2. Set Delay Ref at Center

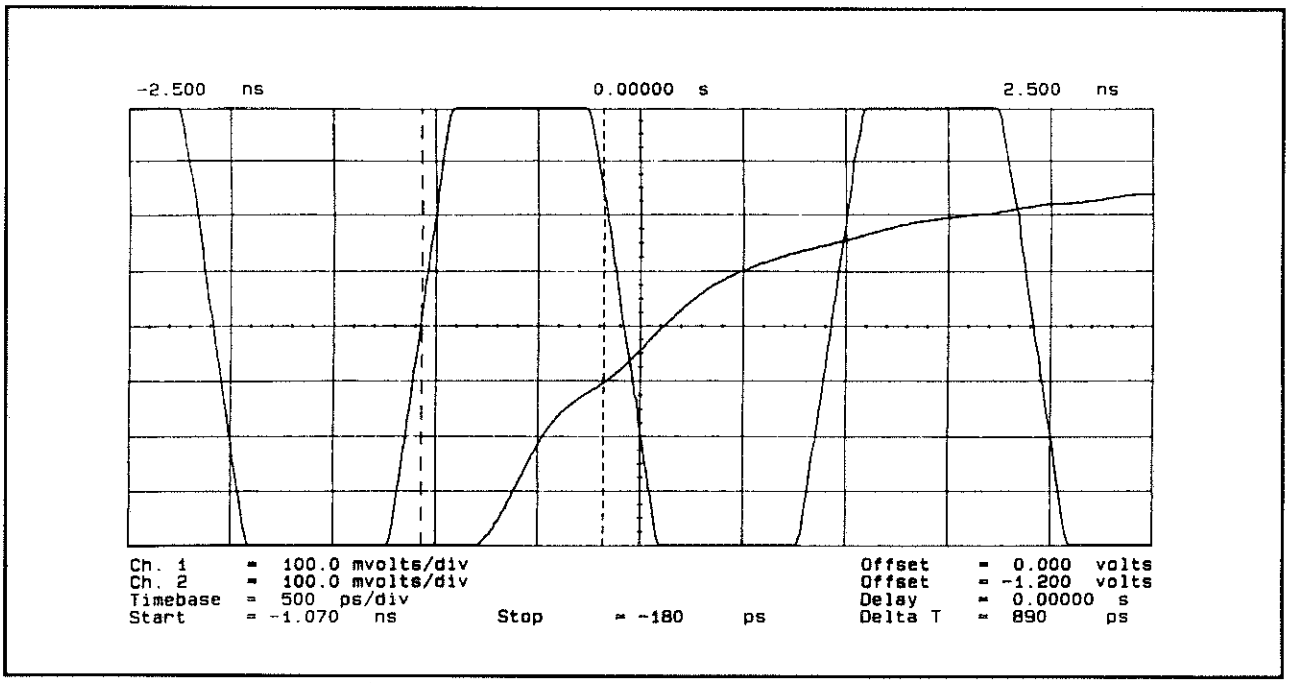


Figure 3-10. Oscilloscope Display of C12 and CLKA

D. Press **Delta t** softkey at the bottom of 54100A CRT display.

1. Set Tmarkers to On.

E. Using the 54100A's rotary knob, set the START MARKER on the rising of 500 MHz reference frequency (CLKA) on channel 1 to 0 Volts.

F. Using the 54100's rotary knob, set the STOP MARKER on the rising edge of CI2 signal on channel 2 at –1.3 Volts. (The STOP MARKER must be place to the right of the START MARKER.)

G. Read "Delta t" displayed in the lower right-hand corner of the 54100A CRT display and refer *Table 3-4* to determine if this CI2-to-CLKA delay is within limits, 200 ps to 1400 ps. If Interpolator 2 (Stop) delay is within limits, the CI-to-CLKA Phase Adjustment for both interpolator channels is now complete. Proceed to Step P. But if the measured time delay is not within specified limits, continue with Step J.

H. Turn 5371A STBY-ON power switch to STBY.

I. Remove SMC cable and test probe from TP2 of the A4 Interpolator Board. Remove the A4 Interpolator Board from the extender board.

J. Locate Interpolator 2 (Stop) delay jumpers W6-W10 by referring to *Figure 3-11*.

K. Refer to the actual A4 Interpolator Board and *Figure 3-11* to determine which delay configuration currently exists in the Interpolator 2 (Stop) circuit.

L. Desolder and remove the 0Ω resistor(s) (i.e., delay jumpers W6-W10) used for the current delay configuration. Solder the required delay configuration, as determined from *Table 3-4*, using 0Ω resistors as delay jumpers.

M. Return the A4 Interpolator Board into the extender board already inserted into slot XA4 of the A12 Motherboard. Reconnect the SMC cable to the A4 Interpolator Board. Insert the test probe into A4TP2.

N. Turn 5371A STBY-ON power switch to ON.

O. The 54100A Oscilloscope should again display the CI2 and 500 MHz reference frequency (CLKA) signals as shown in *Figure 3-10*. Return to Step C. Repeat this process until until the measured time delay falls within limits listed in *Table 3-4*.

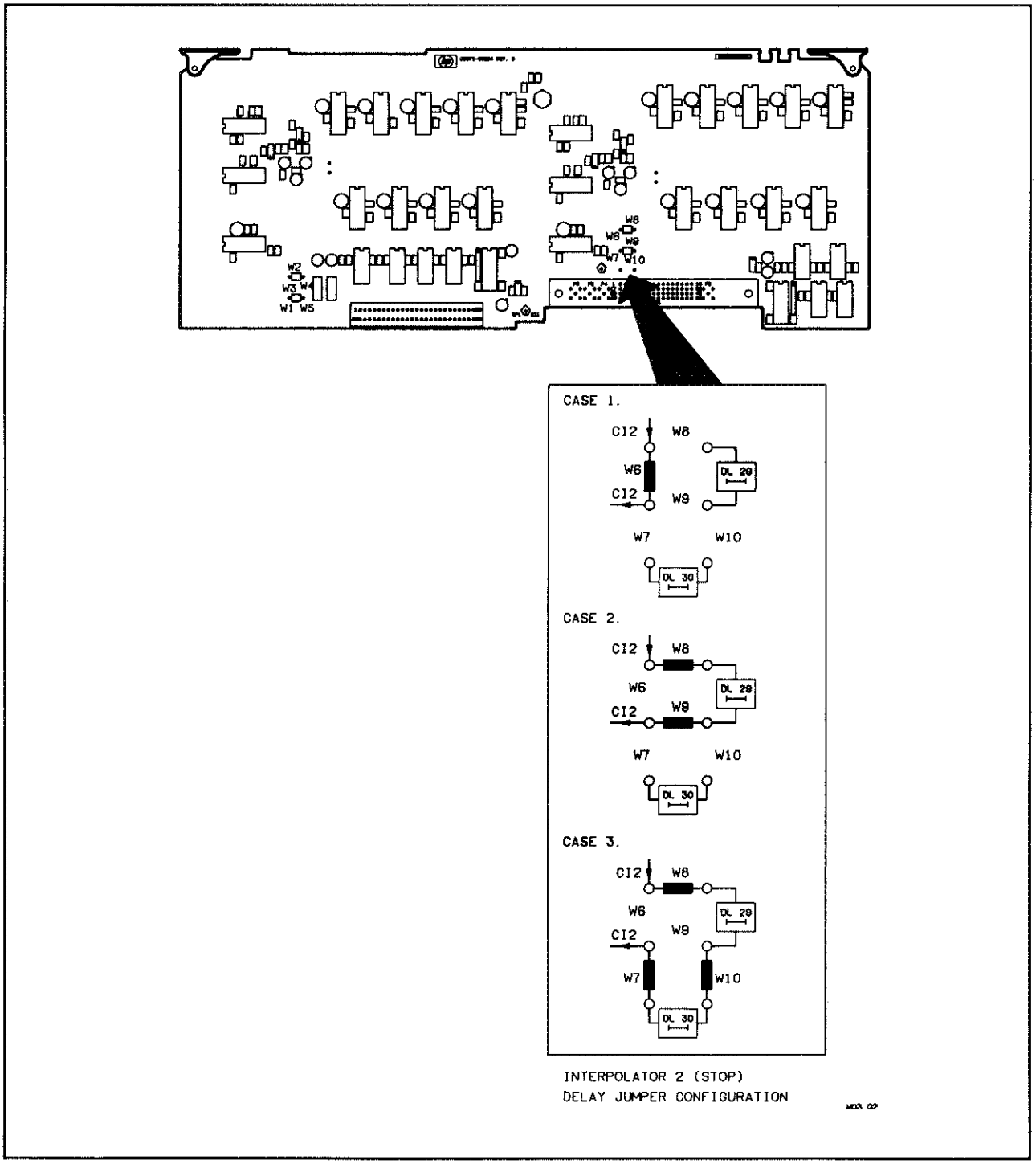


Figure 3-11. Interpolator 2 (Stop) Delay Configurations

After completing the adjustment procedure, return the HP 5371A to normal operation as follows:

A. Turn 5371A STBY-ON power switch from ON to STBY.

B. Remove the extender cable from the A4.

C. Remove the A4 from the extender board.

D. Remove the extender board from the Motherboard.

E. Remove the oscilloscope channel 1 cable and adapter from the A5. Reconnect the Clock cable to the A5.

F. Reconnect the A4 to the Motherboard.

G. Remove the extender cable from the Clock cable. Reconnect the Clock cable to the A4.

H. Reconnect ribbon cable, W6, to connectors A5J2 and A6J1, or return service jumper A6J3 to NORMAL left-most position.

3-25. A5 ZDT Bias Adjustments

NOTE

The following procedures apply to A5 Assemblies with HP Part Number 05371-60027 only. For A5 Assemblies with HP Part Number 05527-60025, refer to the backdating information in Section 5.

Equipment Used: HP 3455A Digital Multimeter

3-26. HP 3455A Digital MultimeterSetup

A. Press the following keys: ~V and AUTO

B. Attach the test probe leads to the V and COM inputs.

3-27. HP 5371A Frequency and Time Interval Analyzer Setup

C. On the HP 5371A, set the power switch to STDBY, and disconnect the HP 5371A power cord from the primary power source.

D. Remove A4.

E. Plug the HP 5371A power cord into the primary power outlet and set the power switch to ON. *IGNORE* the ZDT failure messages on the HP 5371A display.

3-28. VCS Bias Adjustment

Description: Potentiometers R602, R603, and R606 are adjusted to set the VCS bias to the value marked on the ZDT label. First, A9R24 (–3.30V ADJUST) is adjusted, then the VCS biases on A5 are set. The adjustments allow the ZDT's to operate over the specified temperature range of 0 to 40 °C.

A. Connect the DVM ground lead to A5TP12, connect the DVM positive lead to pin 3 of A5TP8. Adjust A9R24 (–3.30V ADJUST) for a –3.25V ±0.001V indication on the DVM.

B. Connect the DVM positive lead to A5TP5 and adjust A5R602 to match the VCS voltage marked on the ZDT label on A5U22 (ZDT1A).

C. Connect the DVM positive lead to A5TP6 and adjust A5R603 to match the VCS voltage marked on the ZDT label on A5U30 (ZDT2A).

D. Connect the DVM positive lead to A5TP7 and adjust A5R606 to match the VCS voltage marked on the ZDT label on A5U28 (ZDT3A).

E. Disconnect power from the HP 5371A and replace the A4 board.

3-29. A2 Input Amplifier Adjustments

NOTE

The first three procedures of this section (*Input Bias Loop and DC Offset, Hysteresis and DC Offset, and DC Offset Refinement*) require that the A2 Input Amplifier be placed on an extender board (HP Part Number 05371-60016). The procedure for placing the A2 assembly on an extender board is described below.

3-30. HP 5371A Frequency and Time Interval Analyzer Setup

A. Turn power switch from ON to STBY.

B. Disconnect the four cables from the A2 Input Amplifier Board.

C. Remove the A2 assembly from its A12 Motherboard slot.

D. Insert the RF Extender Board, HP Part Number 05371-60016, into the A2 slot of A12 Motherboard.

E. Insert the A2 assembly into the extender board.

F. Reconnect the cables to the A2 assembly. For Channel A, use extension cable 05371-60222 found in the Support Service Kit.

G. Turn power switch to ON position.

NOTE

The following five adjustments must be performed in the order presented: *Input Bias Loop and DC Offset, Hysteresis and DC Offset, DC Offset Refinement, Hysteresis Refinement*, and *DC Offset Control Gain*.

3-31. INPUT BIAS LOOP AND DC OFFSET ADJUSTMENT

***Description**: Both adjustments are directed toward the A2 DC Offset Hybrids, U2 and U14. The input bias loop gain adjustment decreases undesired DC offsets. The DC Offset adjustment minimizes the oscillation of the DC Feedback control signal.*

Equipment Used: HP 3455A Digital Multimeter
HP 3325A Synthesizer/Function Generator

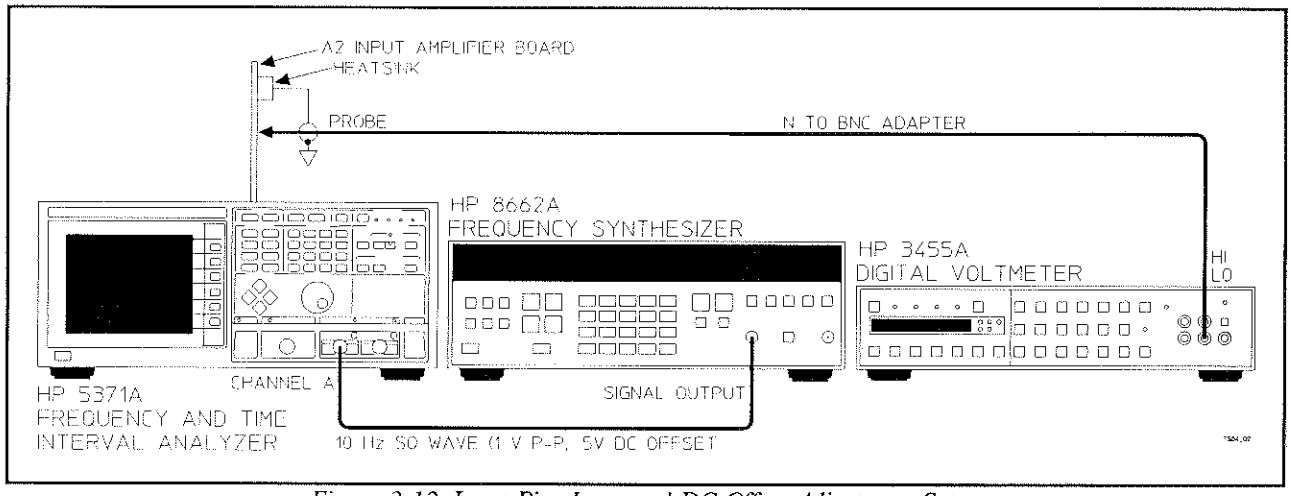


Figure 3-12. Input Bias Loop and DC Offset Adjustment Setup

3-32. HP 3325A Setup

A. Press the FREQ key, enter "10", and press Hz key.

B. Press the AMPTD key, enter "1", and press VOLT key.

C. Press the DC OFFSET key, enter "0.5", and press VOLT key.

D. Select the square wave (10 MHz) function.

3-33. HP 3455A Digital Multimeter

A. Press the following keys: –V and AUTO

B. Attach the test probe leads to the V and COM inputs.

3-34. HP 5371A Frequency and Time Interval Analyzer Setup

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **FREQUENCY** softkey.

D. Press INPUT key.

E. Move the cursor to the "Chan A: Mode" field.

F. Press the **MANUAL TRIG** softkey.

G. Move the cursor to the "Chan B: Mode" field.

H. Press the **MANUAL TRIG** softkey.

3-35. Channel A Input Bias Loop Adjustment Procedure

A. Connect a BNC cable between the SIGNAL output of the 3325A and the 5371A CHANNEL A input pod.

B. Connect the test probe point to either end of A2R50. Connect the ground clip to the heat sink of any of the hybrids or to the chassis.

C. Adjust A2R3 until the AC voltage displayed on the HP 3455A is between 1 mV and 15 mV RMS.

D. Detach the BNC cable from the HP 5371A Channel A input pod and re-attach it to the Channel B input pod.

3-36. Channel B Input Bias Loop Adjustment Procedure

A. Connect a BNC cable between the SIGNAL output of the 3325A and the 5371A CHANNEL B input pod.

B. Press the HP 5371A FUNCTION key.

C. Move the cursor to the "Channel" field.

D. Press the **B** softkey.

E. Connect the test probe point to either end of A2R101.

F. Adjust A2R1 until the AC voltage displayed on the HP 3455A is between 1 mV and 15 mV RMS.

3-37. Channel B DC Offset Adjustment Procedure

A. Press the 3325A FREQ key, enter "100", and press Hz key.

B. Connect the test probe point to either end of A2R103.

C. Adjust A2R2 until the AC voltage displayed on the 3455A is less than 1 mV RMS.

D. Detach the BNC cable connected to the 5371A CHANNEL B input pod.

3-38. Channel A DC Offset Adjustment Procedure

A. Connect BNC cable between the SIGNAL output of the 3325A and the 5371A CHANNEL A input pod.

B. Press the **A** softkey.

C. Connect the test probe point to either end of A2R63.

D. Adjust A2R4 until the AC voltage displayed on the HP 3455A is less than 1 mV RMS.

3-39. Hysteresis: Width and DC Offset Adjustment

Description: DC offsets introduced by the comparators A2U4 and A2U15 are undesirable and must be minimized. The comparators' hysteresis window widths are set to 8 mV (0V ± 4V).

Equipment used: HP 1725A Oscilloscope
HP 3325A Synthesizer/Function Generator

NOTE

The *Hysteresis and DC Offset, DC Offset Refinement, and Hysteresis Refinement* adjustment procedures, whose adjustments primarily affect A2 comparators U4 and U15, comprise a two-pass system for adjusting the comparator hysteresis and DC offset. The *Hysteresis and DC Offset Adjustment* procedure performs a coarse adjustment of the the hysteresis and DC offset. The *DC Offset Refinement Adjustment* and *Hysteresis Refinement Adjustment* provide fine hysteresis and DC Offset adjustments.

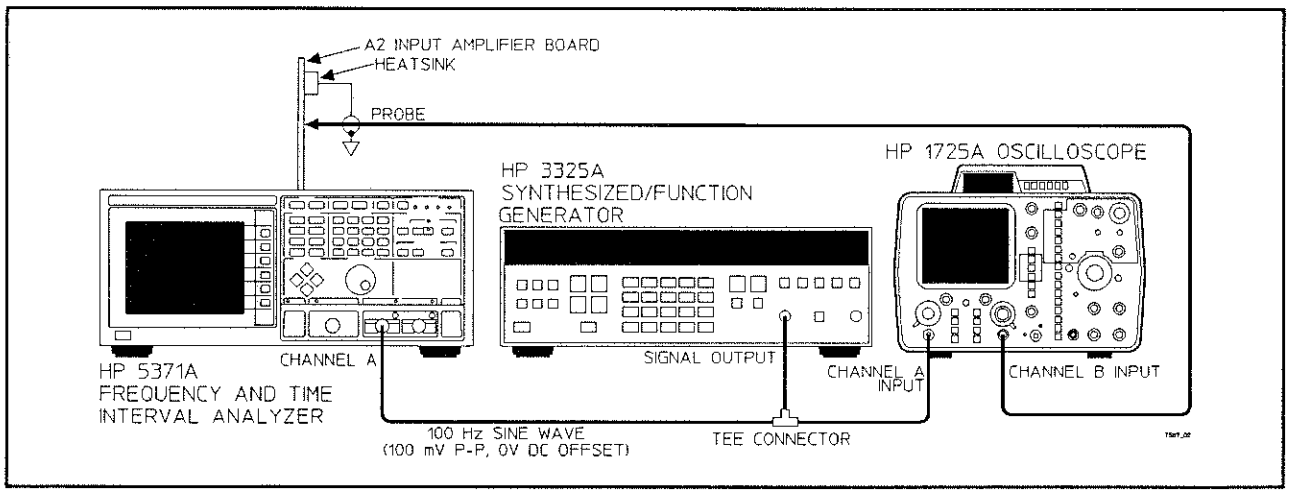


Figure 3-13. Hysteresis and DC Offset Adjustment Setup

3-40. HP 3325A Setup

A. Press FREQ key, enter "100", and press Hz key.

B. Press DC OFFSET key, enter "0", and press mV key.

C. Press AMPTD key, enter "100", and press mV key.

D. Select the sine wave (20 MHz) function.

3-41. HP 1725A Oscilloscope Setup

A. Set both Channel A and Channel B oscilloscope vertical inputs to 1MΩ termination.

B. Display and center the Channel A horizontal "ground" line.

C. Display and center the Channel B horizontal "ground" line.

D. Set the Channel A vertical input sensitivity to 0.01 VOLTS/DIV.

E. Set the Channel B vertical input sensitivity to 0.05 VOLTS/DIV.

F. Connect a test probe to Channel B. (HP 10017A 10:1 1 MΩ Probe is recommended.)

3-42. HP 5371A Frequency and Time Interval Analyzer Setup

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **FREQUENCY** softkey.

D. Press INPUT key.

E. Move the cursor to the "Chan A: Mode" field.

F. Press the **MANUAL TRIG** softkey.

G. Move the cursor to the "Chan B: Mode" field.

H. Press the **MANUAL TRIG** softkey.

I. Attach a t-connector to the Channel A input pod.

J. Connect a BNC cable from the t-connector to the Channel A input of the oscilloscope.

K. Connect a BNC cable from the t-connector to the SIGNAL output of the HP 3325A.

3-43. Channel A Hysteresis Width and DC Offset Adjustment Procedure

A. Insert the test probe point in the test hole located at the upper end of A2R24 as shown in *Figure 3-20A*. (This hole is drilled through the pc board and located between resistors A2R10 and A2J2.) Attach the ground clip to the heat sink of the hybrids or to the metal chassis.

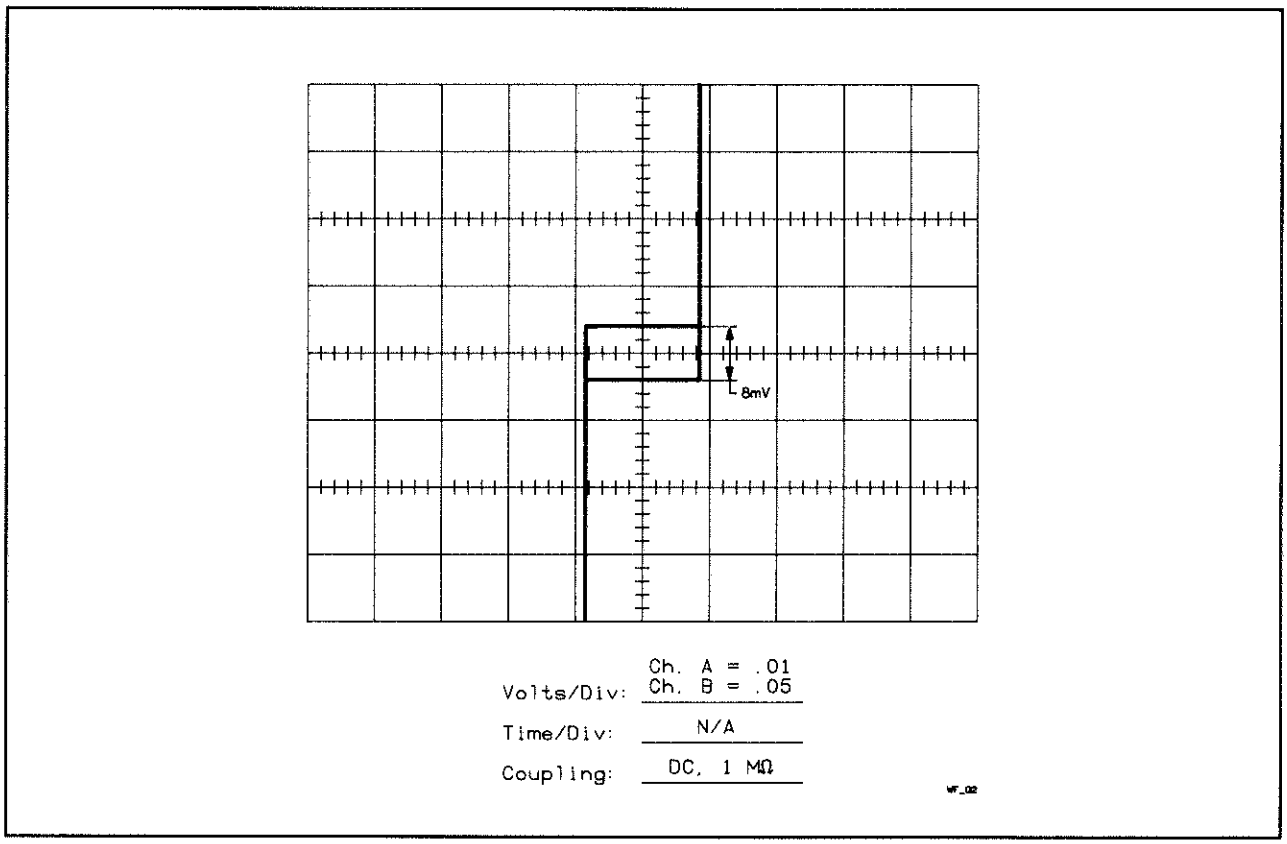


Figure 3-14. Comparator Hysteresis Width

B. Set the oscilloscope HORIZONTAL DISPLAY to X-Y. A hysteresis waveform similar to the *Figure 3-14* should be displayed.

C. Adjust A2R10 to vertically center the hysteresis at the center of the display.

D. Adjust A2R12 to set the hysteresis width to 8 mV.

3-44. Channel B Hysteresis Width and DC Offset Adjustment Procedure

A. Detach the tee-connector from the Channel A input pod.

B. Re-attach the tee-connector to the HP 5371A Channel B input pod.

C. Press the HP 5371A FUNCTION key.

D. Move the HP 5371A cursor to the "Channel" field and press the **B** softkey.

E. Insert the test probe point in the test hole located at the upper end of A2R79 as shown in *Figure 3-20A*. (This hole is drilled through the pc board and is located between resistors A2J4 and A2C30.)

F. Adjust A2R11 to vertically center the hysteresis at the center of the display of the oscilloscope.

G. Adjust A2R13 to set the hysteresis width to 8 mV.

3-45. DC Offset Refinement

Description: Minimize the undesired DC offsets introduced by the comparators, A2U4 and A2U15. A sine wave with perfect symmetry and 0 V DC offset should cause the comparator to produce a 50% duty cycle square wave. DC offsets would vary the duty cycle. Adjust the DC offsets until the comparator output has a 50% duty cycle.

Equipment Used: HP 5335A Universal Counter
HP 3325A Synthesizer/Function Generator

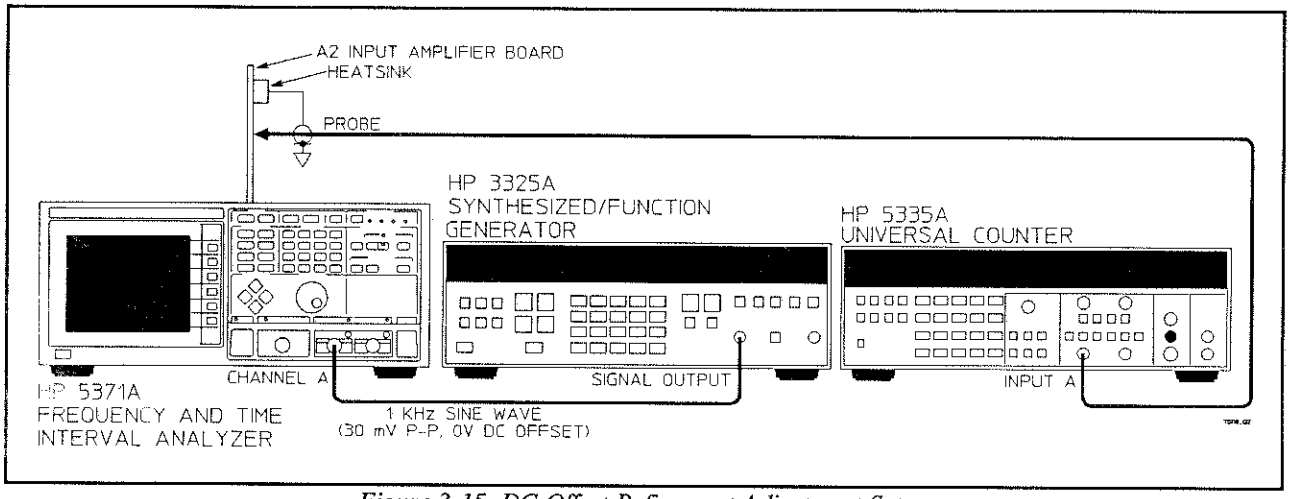


Figure 3-15. DC Offset Refinement Adjustment Setup

3-46. HP 3325A Setup

A. Press the FREQ key, enter "1", and press kHz key.

B. Press the DC OFFSET key, enter "0", and press mV key.

C. Press the AMPTD key, enter "30", and press mV key.

D. Select the sine wave (20 MHz) function.

3-47. HP 5335A Setup

A. Press DUTY CY A located in FUNCTION block.

B. Press AUTO TRIG located in INPUT block.

C. Press the Input A FILTER key located in INPUT block.

D. Connect a test probe to the INPUT A connector.

3-48. HP 5371A Frequency and Time Interval Analyzer Setup

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **FREQUENCY** softkey.

D. Press INPUT key.

E. Move the cursor to the "Chan A: Mode" field.

F. Press the **MANUAL TRIG** softkey.

G. Move the cursor to the "Chan B: Mode" field.

H. Press the **MANUAL TRIG** softkey.

I. Connect a BNC cable from the Channel A input pod to the HP 3325A SIGNAL output connector.

3-49. Channel A DC Offset Refinement Adjustment Procedure

A. Insert the test probe point in the test hole located at the upper end of A2R24 as shown in *Figure 3-20A*. (This hole is drilled through the pc board and located between resistors A2R10 and A2J2.) Attach the ground clip to the heat sink of the hybrids or to the metal chassis.

B. Adjust A2R10 until the HP 5335A displays a duty cycle between 49% and 51%.

C. Press the HP 5335A MIN key located in the CYCLE block.

D. Press the HP 5335A MEAN key located in the STATISTICS block.

E. The duty cycle readings are now averaged over a hundred measurements. The values are displayed every 6 or 7 seconds. Adjust A2R10 until the HP 5335A displays a duty cycle between 49.8% and 50.2%.

3-50. Channel B DC Offset Refinement Adjustment Procedure

A. Detach the BNC cable from the HP 5371A Channel A input pod and re-attach it to the Channel B input pod.

B. Press the HP 5371A FUNCTION key.

C. Move the cursor to the "Channel" field.

D. Press the **B** softkey.

E. Insert the test probe point in the test hole located at the upper end of A2R79 as shown in *Figure 3-20A*. (This hole is drilled through the pc board and is located between resistors A2J4 and A2C30.)

F. Press the HP 5335A NORM key located in the CYCLE block.

G. Press the HP 5335A MEAN key to turn the mean off.

H. Adjust A2R11 until the HP 5335A displays a duty cycle between 49% and 51%.

I. Press the HP 5335A MIN key again.

J. Press the HP 5335A MEAN key and it should light.

K. Adjust A2R11 until the HP 5335A displays a duty cycle between 49.8% and 50.2%.

3-51. Hysteresis Refinement

Description: Adjust comparator hysteresis width to 8 mV. An 8 mV p-p input signal should just trigger the comparator on each cycle. Adjust the comparator hysteresis window to the width that will just trigger on each cycle of the signal. The HP 5371A should then display a minimum frequency near the frequency of the input signal.

Equipment Used: HP 3325A Synthesizer/Function Generator

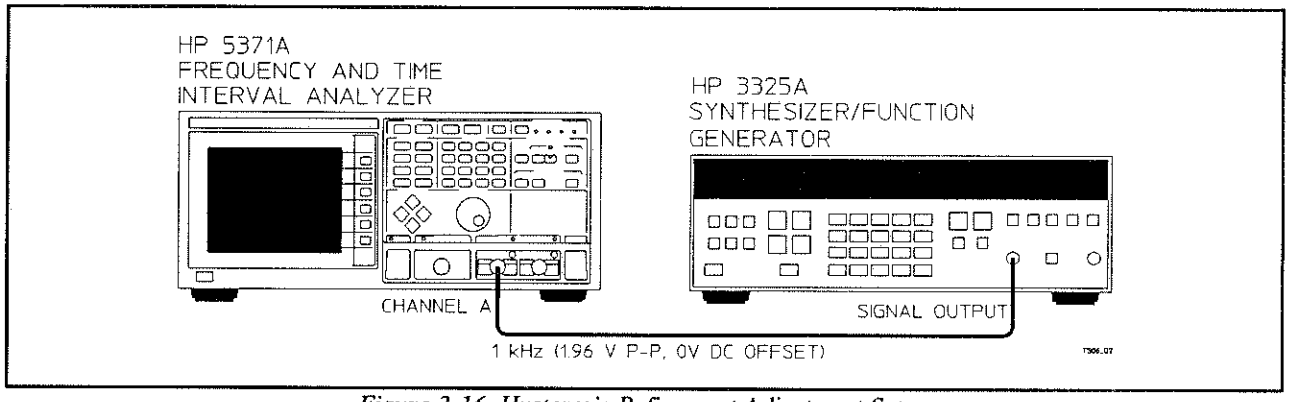


Figure 3-16. Hysteresis Refinement Adjustment Setup

3-52. HP 3325A Setup

A. Press the FREQ key, enter "1", and press kHz key.

B. Press the DC OFFSET key, enter "0", and press mV key.

C. Press the AMPTD key, enter "8", and press mV key.

D. Select the sine wave (20 MHz) function.

3-53. HP 5371A Frequency and Time Interval Analyzer Setup

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **FREQUENCY** softkey.

D. Move the cursor to the "meas" field.

E. Press "1", "0", "0", and ENTER keys.

F. Press MATH key.

G. Move the cursor to the "Chan A Statistics" field.

H. Press the **ON** softkey.

I. Move the cursor to the "Chan B Statistics" field.

J. Press the **ON** softkey.

K. Press INPUT key.

L. Move the cursor to the "Chan A: Mode" field.

M. Press the **MANUAL TRIG** softkey.

N. Move the cursor to the "Chan B: Mode" field.

O. Press the **MANUAL TRIG** softkey.

P. Press NUMERIC key.

Q. Press the **Result Displays** softkey or, if not a possible menu selection, press **Return to Main Menu**..

R. Press the **Result/Statistics** softkey.

S. Connect a BNC cable from the Channel A input pod to the SIGNAL output connector of the HP 3325A.

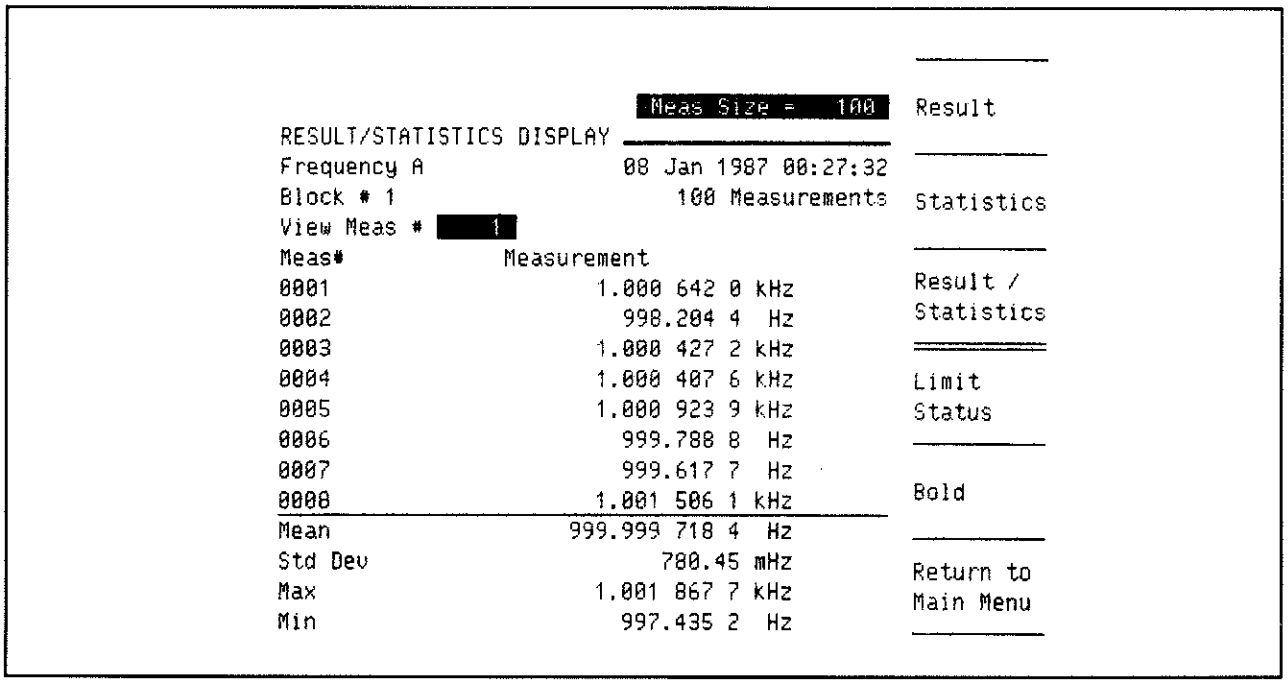


Figure 3-17. Numeric Results Screen

3-54. Channel A Hysteresis Refinement Adjustment Procedure

A. Adjust A2R12 such that the "Min" frequency indicates values as low as possible yet all greater than 900 Hz. See *Figure 3-17* for an example of the display being referenced.

3-55. Channel B Hysteresis Refinement Adjustment Procedure

A. Detach the BNC cable from Channel A and connect it to Channel B.

B. Press the HP 5371A FUNCTION key.

C. Move the cursor to the "Channel" field.

D. Press the **B** softkey.

E. Press NUMERIC key.

F. Carefully adjust A2R13 until the "Min" frequency indicates readings as low as possible yet all still above 900 Hz.

3-56. DC Offset Control Gain

***Description**: Adjust the gain of an inverting amplifier to compensate the DC offset control voltage for high-frequency roll-off. The gain of the DAC that sends the DC offset control voltage decreases at high frequency. Adjust the gain at low frequency to give DC offsets at the high tolerance level. This results in DC offsets at the high tolerance level at high frequency and DC offsets that are very accurate for all frequencies in between.*

Equipment Used: HP 3325A Synthesizer/Function Generator

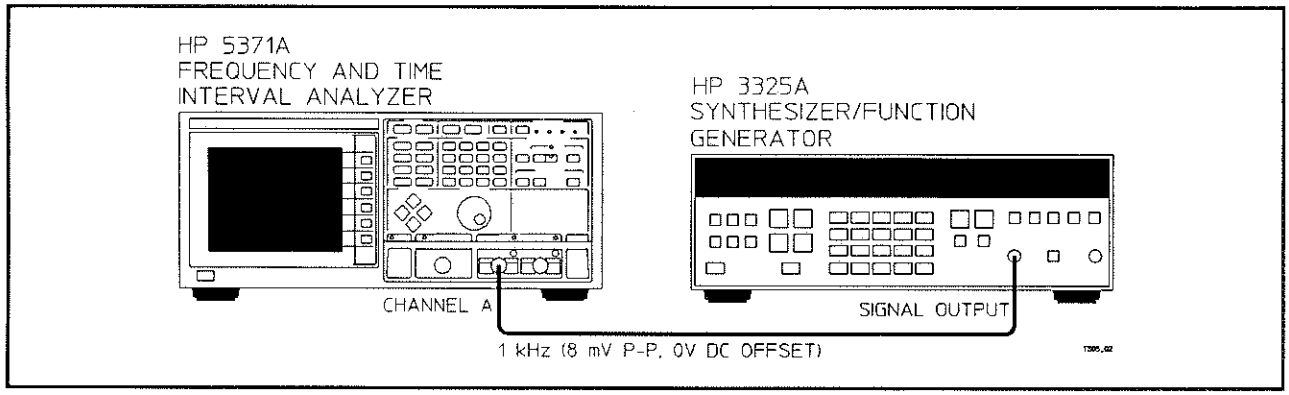


Figure 3-18. DC Offset Gain Adjustment Setup

3-57. HP 3325A Setup

A. Press FREQ key, enter "1", and press kHz key.

B. Press DC OFFSET key, enter "0", and press mV key.

C. Press AMPTD key, enter "1.96", and press VOLT key.

D. Select the sine wave (20 MHz) function.

3-58. HP 5371A Frequency and Time Interval Analyzer Setup

A. Press PRESET key.

B. Move the cursor to the "Measurement" field if not there already.

C. Press the **More** softkey twice, followed by the **PEAK AMPLITUDE** softkey.

D. Move the cursor to the "block" field.

E. Press "1", "0", ENTER, and MATH keys.

F. Move the cursor to the "Chan A Statistics" field.

G. Press the **ON** softkey.

H. Move the cursor to the "Chan B Statistics" field.

I. Press the **ON** softkey, NUMERIC hardkey, **Return to Main Menu** (if necessary), and the **Result Displays** and **Result/Statistics** softkeys.

J. Connect a BNC cable between the HP 3325A SIGNAL output and the HP 5371A Channel A input pod.

3-59. Channel A DC Offset Control Gain Adjustment Procedure

A. Adjust A2R14 until the "Mean +P" value indicated by the HP 5371A on the Statistics area of the Numeric Results screen is between 1.000 and 1.001 Volts.

B. Detach the BNC cable from the HP 5371A Channel A input pod.

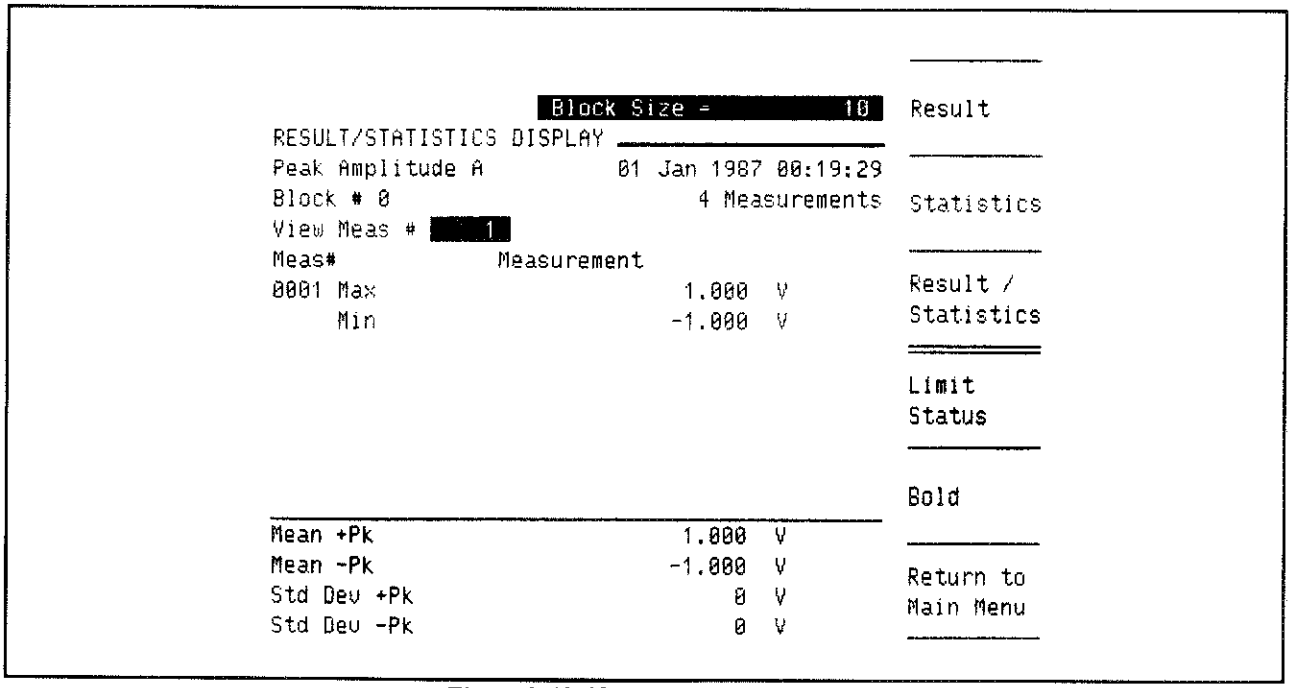


Figure 3-19. Numeric Screen Results

3-60. Channel B DC Offset Control Gain Adjustment Procedure

A. On the 5371A front panel, press FUNCTION hardkey, move the cursor to the "Channel" field, press the **B** softkey, and press the NUMERIC hardkey.

B. Adjust A2R15 until the "Mean +P" value indicated by the 5371A Statistics area of the Numeric Results screen is between 1.000 and 1.001 Volts.

3-61. Extender Board Removal

A. Turn the HP 5371A power switch from ON to STBY.

B. Detach the cables from the A2 assembly and remove the board from the extender board. Remove the extender board from the A12 Motherboard connector.

C. Insert the A2 assembly into its A12 Motherboard slot, and re-attach the cables to the A2 assembly.

D. Turn the HP 5371A power switch from STBY to ON.

3-62. A17 CRT and Driver Board Adjustments

Description: This procedure adjusts the CRT display until it is visually satisfactory to the user.

3-63. HP 5371A Frequency and Time Interval Analyzer Setup

A. Turn 5371A STBY-ON power switch to ON if not powered up already.

B. Press 5371A TEST key.

C. Select Test 19, CRT Video Adjustment.

D. Press Run softkey.

3-64. A17 CRT and Driver Board Adjustment Procedure

The following adjustable components are accessible through the internal Power Supply Cover, MP7. Use the labels provided on MP7 to locate the all adjustable components. Adjust the following until the screen display is satisfactory:

- VERTICAL HOLD
- HORIZONTAL HOLD
- HORIZONTAL WIDTH
- VERTICAL SIZE
- CONTRAST
- BRIGHTNESS
- FOCUS

A. Using an alignment tool, rotate VERTICAL HOLD ccw until display just begins to roll. Note position of the pot. Repeat by rotating pot in opposite direction, cw. Adjust this pot between these two limits.

B. Using an alignment tool, rotate HORIZONTAL HOLD until test pattern is centered on CRT.

C. To gain access to the HORIZONTAL WIDTH adjustment component, remove the left side cover of the HP 5371A, as viewed from the front of the instrument. Using an alignment tool, rotate HORIZONTAL WIDTH cw to increase width and ccw to decrease width. If display is off center, repeat Steps E and F.

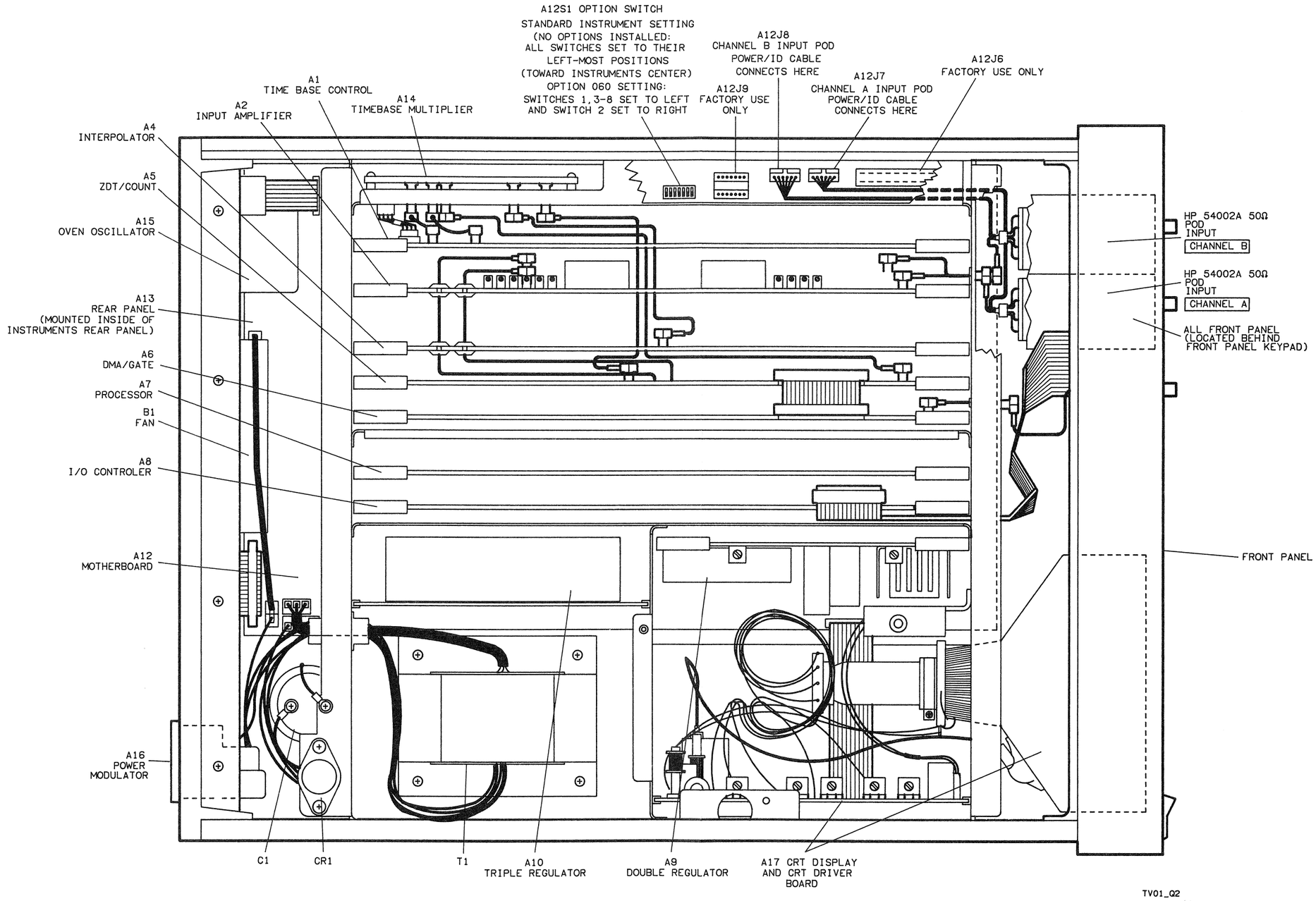
D. Using an alignment tool, rotate VERTICAL SIZE until test pattern is within CRT grid markings. This adjustment need not be exact.

E. Using an alignment tool, set CONTRAST minimum by rotating in cw direction.

F. Using an aligment tool, set BRIGHTNESS to maximum then adjust until retrace just disappears.

G. Using an alignment tool, adjust CONTRAST until display is visible in ambient light of 5371A operating location.

THE HP 5371A ADJUSTMENTS ARE NOW COMPLETE.



SEE FIGURES 3-20A THROUGH 3-20F

Figure 3-20. 5371A Adjustment Locators

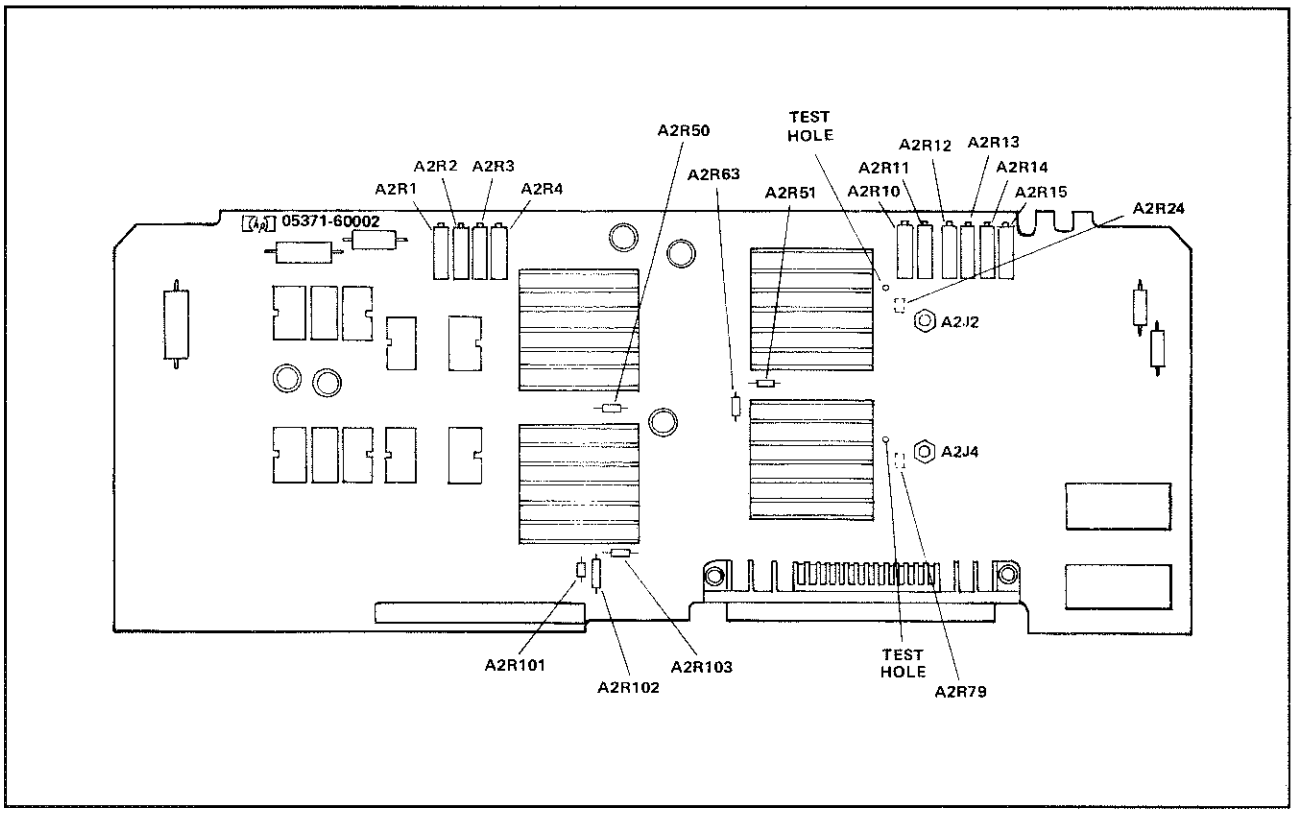


Figure 3-20A. A2 Input Amplifier Board Adjustment Locator

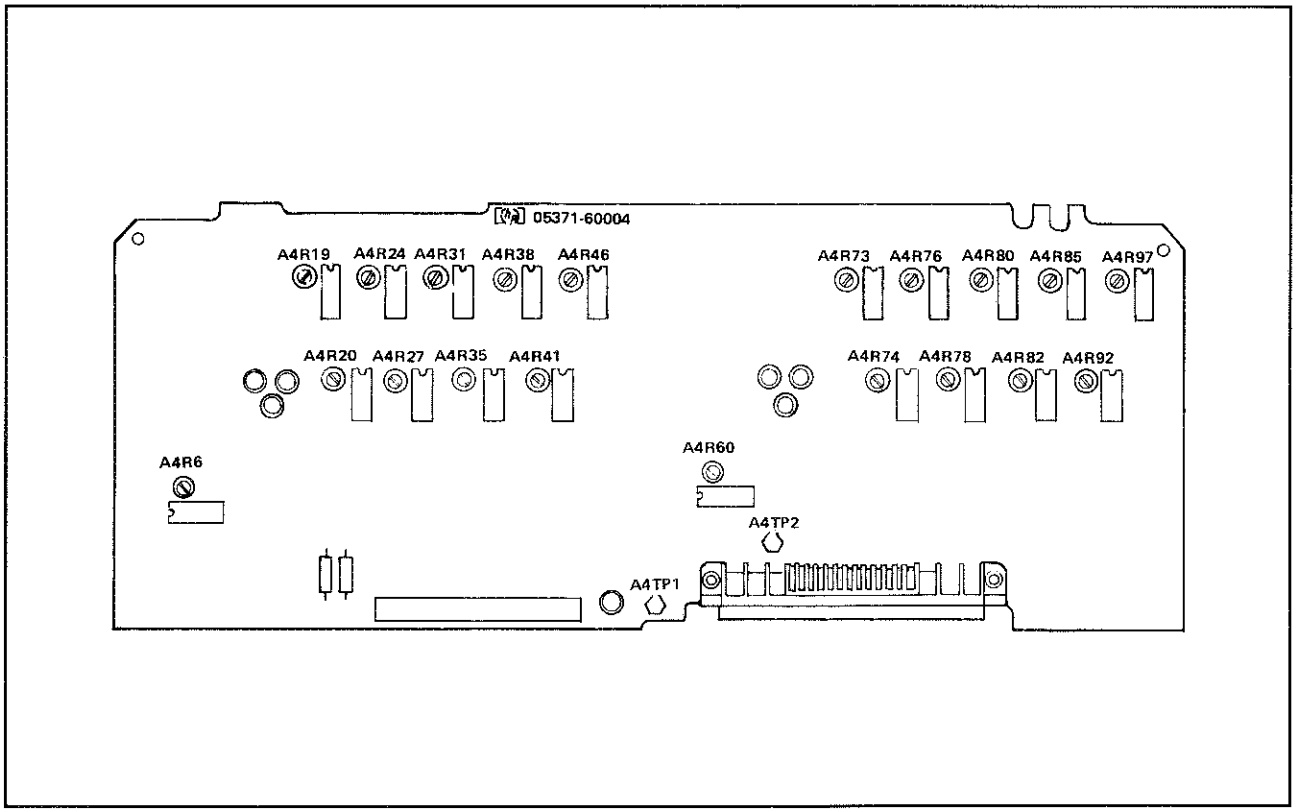


Figure 3-20B. A4 Interpoator Board Board Adjustment Locator

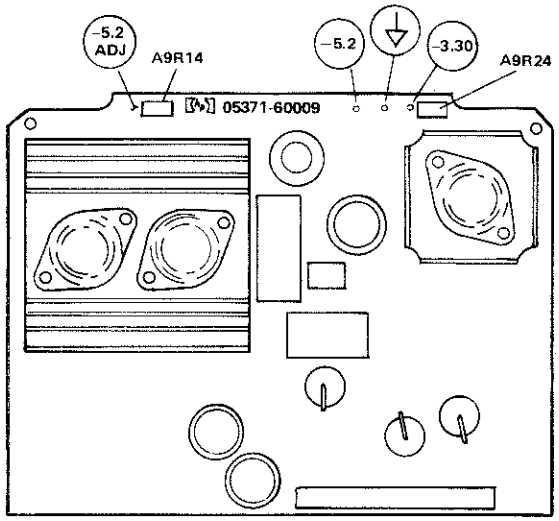


Figure 3-20C. A9 Double Regulator Board Adjustment Locator

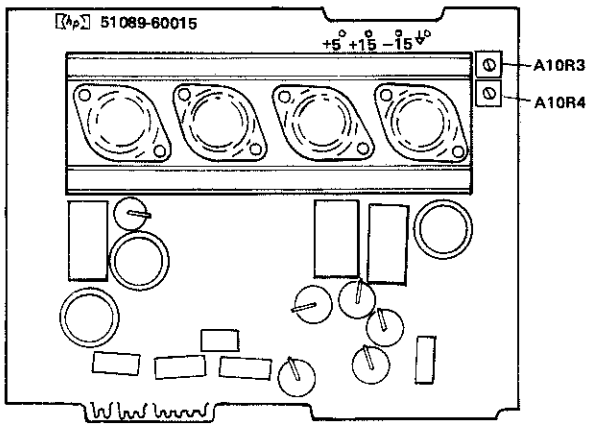


Figure 3-20D. A10 Triple Regulator Board Adjustment Locator

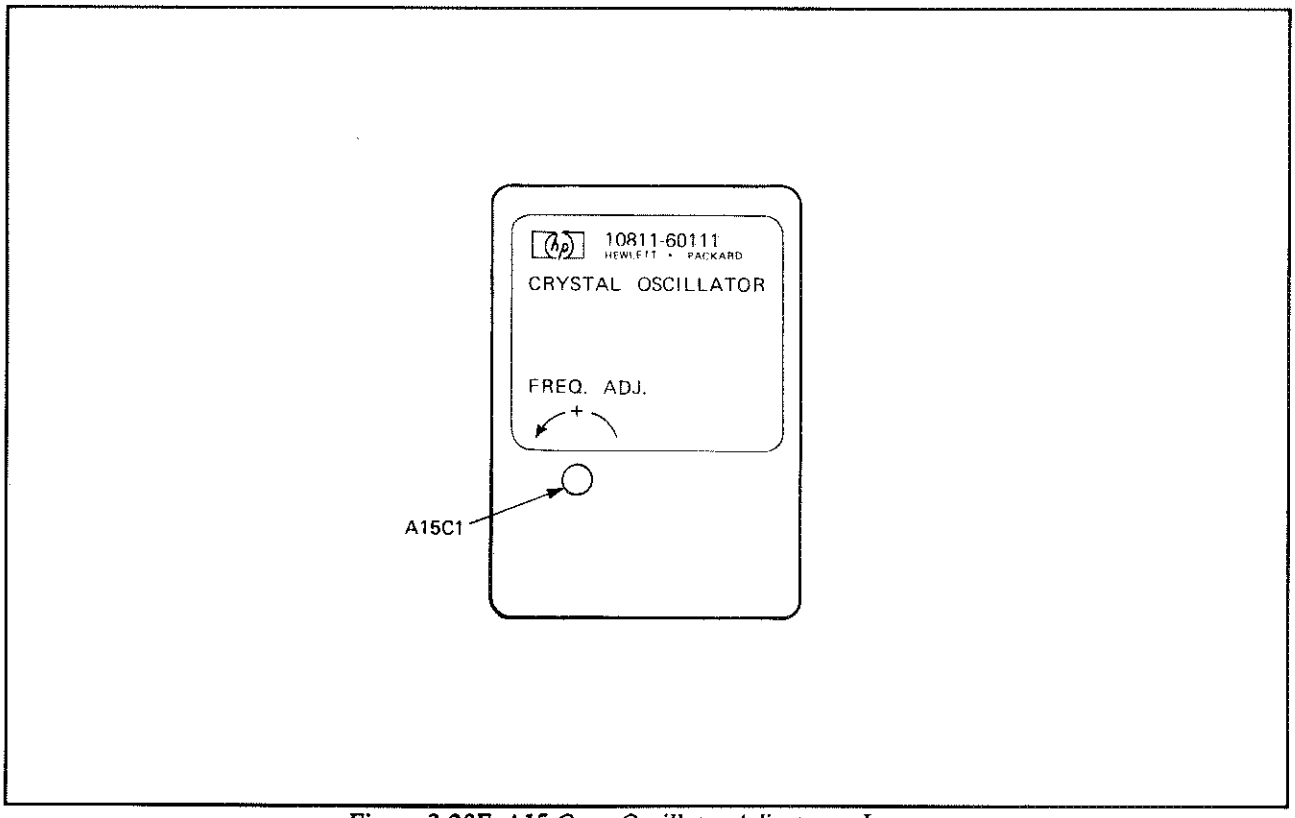


Figure 3-20E. A15 Oven Oscillator Adjustment Locator

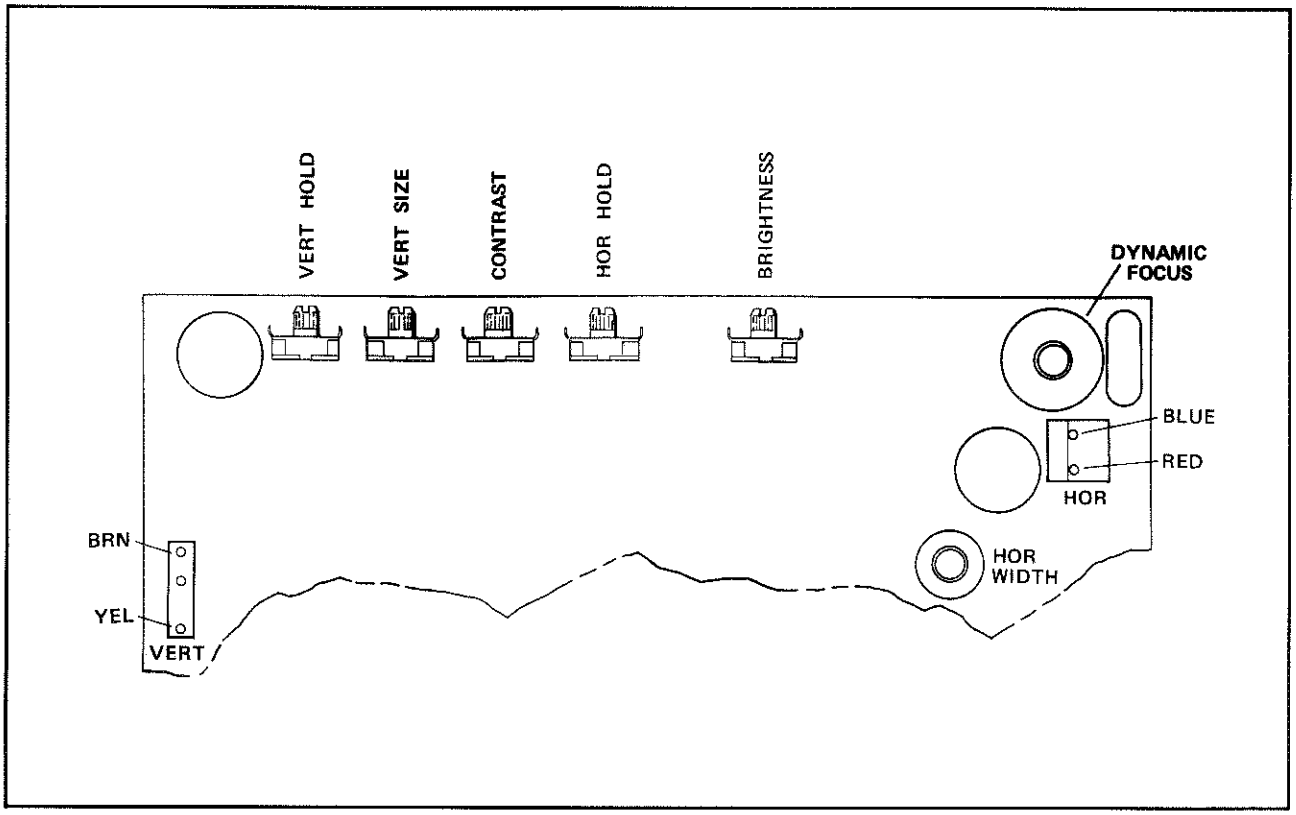


Figure 3-20F. A17 Driver Board Adjustment Locator

HEWLETT-PACKARD MODEL 5371A
FREQUENCY AND TIME INTERVAL ANALYZER

Serial Number: _____ Repair/Work Order No. _____

Test Performed by: _____ Temperature: _____

Date: _____ Relative Humidity: _____

Notes: _____

PART NO.	TEST	RESULTS		
		MINIMUM	ACTUAL	MAXIMUM
3-8.	**A9 & A10 Regulators**			
	–5.2 V	–5.21 V	_____	–5.19 V
	–3.3 V	–3.29 V	_____	–3.27 V
	–15 V	–15.01 V	_____	–14.99 V
	+15 V	14.99 V	_____	15.01 V
	+5 V	4.8 V	_____	5.2 V
3-11.	**A15 Oven Oscillator**			
	Offset	0.0	_____	$5*10_{10}$
3-14.	**A4 Interpolator**	**Resolution**		
		Pass	**Fail**	
	Start	_____	_____	
	Stop	_____	_____	
	CI1-to-CLKA Phase			
	Start		_____	
	Stop		_____	
3-25.	**A5 ZDT Bias Adjustments**			
	–3.30V Adj	–3.249	_____	–3.251V
	VCS – A5U22		_____	
	VCS – A5U30		_____	
	VCS – A5U28		_____	
3-29.	**A2 Input Amplifier**	Input Bias Loop		
	Channel A	1.0 mV	_____	15.0 mV
	Channel B	1.0 mV	_____	15.0 mV
		DC Offset		
	Channel A	0.0 mV	_____	15.0 mV
	Channel B	0.0 mV	_____	15.0 mV

PART NO.	TEST	RESULTS		
		MINIMUM	ACTUAL	MAXIMUM
3-29.	**A2 Input Amplifier (Continued)** Channel A Channel B	Hysteresis Width 8 mV 8 mV	_____ _____	
	Channel A Channel B	DC Offset Refinement 49.8% 49.8%	_____ _____	50.2% 50.2%
	Channel A Channel B	Hysteresis Refinement 900.0 Hz 900.0 Hz		1000.0 Hz 1000.0 Hz
	Channel A Channel B	DC Offset Control Gain 1.000 V 1.000 V	_____ _____	1.001 V 1.001 V
3-62.	**A17 CRT**	**Pass** _____	**Fail** _____	

4 PARTS LIST

SECTION 4
REPLACEABLE PARTS

4-1. INTRODUCTION

This section contains information for ordering replacement parts. Part numbers for replacement parts are provided in either illustrated parts breakdown or tabulated listings depending on the type of part. Purchase Order and Direct Mail Order information is also provided in this section.

Table 4-1 gives gives abbreviations and reference designators used in the parts lists and throughout this manual. *Table 4-2* lists replaceable parts that are mounted on pc board assemblies. *Table 4-3* lists all miscellaneous cabinet and chassis parts, including instrument hardware (nuts and screws).

Figure 4-1 is an Illustrated Parts Breakdown showing all miscellaneous cabinet and chassis parts, and instrument hardware.

4-2. REPLACEABLE PARTS LIST

Tables 4-2 and *4-3* list pc board-mounted and miscellaneous chassis-mounted replaceable parts. They are organized by electrical assemblies with their components listed in alphanumerical order by reference designation.

The information given for each part consists of the following:

a. Hewlett-Packard part number.

b. Part number check digit (CD).

c. Total quantity (Qty) in each assembly.

d. Description of the part.

e. Typical manufacturer of the part in a five-digit code.

f. Manufacturer's number for the part.

The total quantity for each assembly is given only once — at the first appearance of the part number in the list for that assembly (A1, A3, etc.).

4-3. Factory Selected Parts

Some of the values in the parts list are selected during manufacture to meet circuit requirements. These parts are marked with an asterisk (*) in the parts list and schematic diagrams, with average values shown.

The only factory selected part contained in the HP 5371A is found within the A15 Oven Oscillator assembly. The 10811-60111 Oven Oscillator contains one factory selected part: A15R20 OVEN TEMPERATURE SET resistor. This resistor is supplied with the crystal, should the crystal require replacement. The crystal and resistor can be ordered as part of kit by ordering HP Part Number 10811-60108. Refer to Section 7S of this manual for additional service information.

4-4. CABINET PARTS AND HARDWARE

To locate and identify miscellaneous cabinet and chassis parts and instrument hardware, refer to *Figures 4-1* though *4-3*. These figures provide various exploded views of the instrument, with the parts identified by reference designations. *Figures 4-2* and *4-3* are accompanied by a table containing part number and description for each mechanical part and piece of hardware reference designation shown.

4-5. SPECIAL PARTS REPLACEMENT CONSIDERATIONS

Certain electrical components require the following special considerations:

a. A17 CRT and Driver Board (HP Part Number 2090-0209): The front-panel Cathode Ray Tube (CRT) Display and its Driver Board are NOT field repairable. The CRT and pc board are shipped as a single unit under the given HP part number. If either the CRT or Driver Board fail, replace them both.

b. The following 5371A assemblies are also NOT field repairable.

   1. A9 Double Regulator Board (HP Part Number 05371-60009)
   2. A10 Triple Regulator Board (HP Part Number 51089-60015)
   3. A11 Front Panel Board (HP Part Number 05371-60011)
   4. A13 Rear Panel Board (HP Part Number 05371-60013)

4-6. ABBREVIATIONS AND REFERENCE DESIGNATIONS

Table 4-1 lists abbreviations used in the parts list, the schematics and throughout the manual. In some cases, two forms of the abbreviations are used, one in all capital letters, and one partial or no capital letters. This occurs because the abbreviations in the parts list are always all capital letters. However, in the schematics and the other parts of the manual, other abbreviation forms are used with both upper and lower case letters.

4-7. ORDERING INFORMATION

To order a part listed in the replaceable parts tables or figures, quote the Hewlett-Packard part number, indicate the quantity required, and address the order to the nearest Hewlett-Packard office.

To order a part that is not listed in this section, include the instrument model number, instrument serial number, the description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

4-8. DIRECT MAIL ORDER SYSTEM

Within the USA, Hewlett-Packard can supply parts through a direct mail order system. Advantages of using the system are as follows:

a. Direct ordering and shipment from the HP Parts Center in Mountain View, California.

b. No maximum or minimum on any mail order (there is a minimum order amount for parts ordered through a local HP office when the orders require billing and invoicing).

c. Prepaid transportation (there is a small handling charge for each order).

d. No invoices — to provide these advantages, a check or money order must accompany each order. Payment may be made using Visa or MasterCard by supplying credit card number, its expiration date, and an authorized signature.

Mail order forms and specific ordering information is available through your local HP office. Addresses and phone numbers are located at the back of this manual.

Table 4-1. Reference Designations and Abbreviations

REFERENCE DESIGNATIONS

A	= assembly	DL	= delay line	K	= relay	T	= transformer
AT	= attenuator, isolator, termination	DS	= annunciator; signaling device (audible or visual); lamp; LED	L	= coil; inductor	TB	= terminal board
B	= fan; motor	E	= miscellaneous electrical part	M	= metre	TC	= thermocouple
BT	= battery	F	= fuse	MP	= miscellaneous mechanical part	TP	= test point
C	= capacitor	FL	= filter	P	= electrical connector (movable portion); plug	U	= integrated circuit; microcircuit
CP	= coupler	H	= hardware	Q	= transistor; SCR; triode thyristor	V	= electron tube
CR	= diode, diode thyristor varactor	HY	= circulator	R	= resistor	VR	= voltage regulator; breakdown diode
DC	= directional coupler	J	= electrical connector (stationary portion); jack	RT	= thermistor	W	= cable; transmission path; wire
				S	= switch	X	= socket
						Y	= crystal unit-piezo-electric
						Z	= tuned cavity; tuned circuit

ABBREVIATIONS

A	= ampere	HD	= head	NE	= neon	SPST	= single-pole, single-throw
ac	= alternating current	HDW	= hardware	NEG	= negative	SSB	= single sideband
ACCESS	= accessory	HF	= high frequency	nF	= nanofarad	SST	= stainless steel
ADJ	= adjustment	HG	= mercury	NI PL	= nickel plate	STL	= steel
A/D	= analog-to-digital	HI	= high	N/O	= normally open	SQ	= square
AF	= audio frequency	HP	= Hewlett-Packard	NOM	= nominal	SWR	= standing-wave ratio
AFC	= automatic frequency control	HPF	= high pass filter	NORM	= normal	SYNC	= synchronize
AGC	= automatic gain control	HR	= hour (used in parts list)	NPN	= negative-positive-negative	T	= timed (slow-blow fuse)
AL	= aluminum	HV	= high voltage	NPO	= negative-positive zero (zero temperature coefficient)	TA	= tantalum
ALC	= automatic level control	Hz	= hertz	NRFR	= not recommended for field replacement	TC	= temperature compensating
AM	= amplitude modulation	IC	= integrated circuit	ns	= nanosecond	TD	= time delay
AMPL	= amplifier	ID	= inside diameter	NSR	= not separately replaceable	TERM	= terminal
APC	= automatic phase control	IF	= intermediate frequency	nW	= nanowatt	TFT	= thin-film transistor
ASSY	= assembly	IMPG	= impregnated	OBD	= order by description	TGL	= toggle
AUX	= auxiliary	in	= inch	OD	= outside diameter	THD	= thread
AVG	= average	INCD	= incandescent	OH	= oval head	THRU	= through
AWG	= american wire gauge	INCL	= include(s)	OP AMP	= operational amplifier	TI	= titanium
BAL	= balance	INP	= input	OPT	= option	TOL	= tolerance
BCD	= binary coded decimal	INS	= insulation	OSC	= oscillator	TRIM	= trimmer
BD	= board	INT	= internal	OX	= oxide	TSTR	= transistor
BE CU	= beryllium copper	kg	= kilogram	oz	= ounce	TTL	= transistor-transistor logic
BFO	= beat frequency oscillator	kHz	= kilohertz	Ω	= ohm	TV	= television
BH	= binder head	kΩ	= kilohm	P	= peak (used in parts list)	TVI	= television interference
BKDN	= breakdown	kV	= kilovolt	PAM	= pulse-amplitude modulation	TWT	= traveling wave tube
BP	= bandpass	lb	= pound	PC	= printed circuit	U	= micro 10-6 (used in parts list)
BPF	= bandpass filter	LC	= inductance-capacitance	PCM	= pulse-code modulation; pulse-count modulation	UF	= microfarad (used in parts list)
BRS	= brass	LED	= light-emitting diode	PDM	= pulse-duration modulation	UHF	= ultrahigh frequency
BWO	= backward-wave oscillator	LF	= low frequency	pF	= picofarad	UNREG	= unregulated
CAL	= calibrate	LG	= long	PH BRZ	= phosphor bronze	V	= volt
ccw	= counterclockwise	LH	= left hand	PHL	= phillips	VA	= voltampere
CER	= ceramic	LIM	= limit	PIN	= positive-intrinsic-negative	Vac	= volts ac
CHAN	= channel	LIN	= linear taper (used in parts list)	PIV	= peak inverse voltage	VAR	= variable
cm	= centimeter	lin	= linear	pk	= peak	VCO	= voltage-controlled oscillator
CMO	= coaxial	LK WASH	= lockwasher	PL	= phase lock	Vdc	= volts dc
COEF	= coefficient	LO	= low; local oscillator	PLO	= phase lock oscillator	VDCW	= volts, dc, working (used in parts list)
COM	= common	LOG	= logarithmic taper (used in parts list)	PM	= phase modulation	V/F	= volts, filtered
COMP	= composition	log	= logarithmic	PNP	= positive-negative-positive	VFO	= variable-frequency oscillator
COMPL	= complete	LPF	= low pass filter	P/O	= part of	VHF	= very-high frequency
CONN	= connector	LV	= low voltage	POLY	= polystyrene	Vpk	= volts peak
CP	= cadmium plate	m	= metre (distance)	PORC	= porcelain	Vp-p	= volts peak-to-peak
CRT	= cathode-ray tube	mA	= milliampere	POS	= positive; position(s) (used in parts list)	Vrms	= volts rms
CTL	= complementary transistor logic	MAX	= maximum	POSN	= position	VSWR	= voltage standing wave ratio
CW	= continuous wave	MΩ	= megohm	POT	= potentiometer	VTO	= voltage-tuned oscillator
cw	= clockwise	MEG	= meg (10^6) (used in parts list)	p-p	= peak-to-peak	VTVM	= vacuum-tube voltmeter
D/A	= digital-to-analog	MET FLM	= metal film	PP	= peak-to-peak (used in parts list)	V/X	= volts, switched
dB	= decibel	MET OX	= metal oxide	PPM	= pulse-position modulation	W	= watt
dBm	= decibel referred to 1 mW	MF	= medium frequency; microfarad (used in parts list)	PREAMPL	= preamplifier	W/	= with
dc	= direct current	MFR	= manufacturer	PRF	= pulse-repetition frequency	WIV	= working inverse voltage
deg	= degree (temperature interval or difference)	mg	= milligram	PRR	= pulse repetition rate	WW	= wirewound
°	= degree (plane angle)	MHz	= megahertz	ps	= picosecond	W/O	= without
°C	= degree Celsius (centrigrade)	mH	= millihenry	PT	= point	YIG	= yttrium-iron-garnet
°F	= degree Fahrenheit	mho	= conductance	PTM	= pulse-time modulation	Zo	= characteristic impedance
°K	= degree Kelvin	MIN	= minimum	PWM	= pulse-width modulation		
DEPC	= deposited carbon	min	= minute (time)	PWV	= peak working voltage		
DET	= detector	'	= minute (plane angle)	RC	= resistance capacitance		
diam	= diameter	MINAT	= miniature	RECT	= rectifier		
DIA	= diameter (used in parts list)	mm	= millimetre	REF	= reference		
DIFF AMPL	= differential amplifier	MOD	= modulator	REG	= regulated		
div	= division	MOM	= momentary	REPL	= replaceable		
DPDT	= double-pole, double-throw	MOS	= metal-oxide semiconductor	RF	= radio frequency		
DR	= drive	ms	= millisecond	RFI	= radio frequency interference		
DSB	= double sideband	MTG	= mounting	RH	= round head; right hand		
DTL	= diode transistor logic	MTR	= meter (indicating device)	RLC	= resistance-inductance-capacitance		
DVM	= digital voltmeter	mV	= millivolt	RMO	= rack mount only		
ECL	= emitter coupled logic	mVac	= millivolt, ac	rms	= root-mean-square		
EMF	= electromotive force	mVdc	= millivolt, dc	RND	= round		
EDP	= electronic data processing	mVpk	= millivolt, peak	ROM	= read-only memory		
ELECT	= electrolytic	mVp-p	= millivolt, peak-to-peak	R&P	= rack and panel		
ENCAP	= encapsulated	mVrms	= millivolt, rms	RWV	= reverse working voltage		
EXT	= external	mW	= milliwatt	S	= scattering parameter		
F	= farad	MUX	= multiplex	s	= second (time)		
FET	= field-effect transistor	MY	= mylar	"	= second (plane angle)		
F/F	= flip-flop	μA	= microampere	S-B	= slow-blow fuse (used in parts list)		
FH	= flat head	μF	= microfarad	SCR	= silicon controlled rectifier; screw		
FOL H	= fillister head	μH	= microhenry	SE	= selenium		
FM	= frequency modulation	μmho	= micromho	SECT	= sections		
FP	= front panel	μs	= microsecond	SEMICON	= semiconductor		
FREQ	= frequency	μV	= microvolt	SHF	= superhigh frequency		
FXD	= fixed	μVac	= microvolt, ac	SI	= silicon		
g	= gram	μVdc	= microvolt, dc	SIL	= silver		
GE	= germanium	μVpk	= microvolt, peak	SL	= slide		
GHz	= gigahertz	μVp-p	= microvolt, peak-to-peak	SNR	= signal-to-noise ratio		
GL	= glass	μVrms	= microvolt, rms	SPDT	= single-pole, double-throw		
GND	= ground(ed)	μW	= microwatt	SPG	= spring		
H	= henry	nA	= nanoampere	SR	= split ring		
h	= hour	NC	= no connection				
HET	= heterodyne	N/C	= normally closed				
HEX	= hexagonal						

NOTE

All abbreviations in the parts list will be in upper case.

MULTIPLIERS

Abbreviation	Prefix	Multiple
T	tera	10^{12}
G	giga	10^{9}
M	mega	10^{6}
k	kilo	10^{3}
da	deka	10
d	deci	10^{-1}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}
n	nano	10^{-9}
p	pico	10^{-12}
f	femto	10^{-15}
a	atto	10^{-18}

Table 4-2. 5371A Board Assemblies Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A1	05371-60001	1	1	TIMEBASE CONTPOL BOARD ASSY (DATE CODE 88265)	28480	05371-60001
A1C1	0180-3769	6	7	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C2	0180-3771	0	6	CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C3	0180-3771	0		CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C4	0160-4554	7	28	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C5	0160-4557	0	25	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C6	0180-3831	3	13	CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C7	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C8	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C9	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C10	0180-3771	0		CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C11	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C12	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C13	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C14	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C15	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C16	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C17	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C18	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C19				NOT ASSIGNED		
A1C20	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C21	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C22	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C23	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C24	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C25	0160-4040	6	4	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A1C26	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C27	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C28	0180-3771	0		CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C29	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C30	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A1C31	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C32	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C33	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C34	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C35	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C36	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C37	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C38	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C39	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C40	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C41	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C42	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C43	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C44	0160-0576	5	5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C45	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C46	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A1C47	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C48	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C49	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C50	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C51	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A1C52	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C53	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C54	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C55	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C56	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C57	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C58	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C59	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C60	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C61	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104[illegible]A
A1C62	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C63	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C64	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C65	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1C66	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C67	0180-3771	0		CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C68	0180-3771	0		CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A1C69	0160-4521	8	4	CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A1C70	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A1C71	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C72	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A1C73	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C74	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C75	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C76	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C77	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C78	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C79	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C80	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C81	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A1C82	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A1C83	0180-3769	6		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	299D685X9035DB1
A1C84	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C85	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A1C86	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C87	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C88	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C89	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C90	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C91	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C92	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A1C93-A1C200				NOT ASSIGNED		
A1C201	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A1C202	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1CR1	1901-0050	3	25	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR23	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR24	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A1DS1	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A1H1	3050-0098	6	2	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098
A1J1	1250-0257	1	2	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1J2	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1J3	1251-8535	6	1	CONN-POST TYPE .100-PIN-SPCG 10-CONT	28480	1251-8535

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A1L1	9140-1170	4	4	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A1L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A1L3	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A1L4	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A1MP1	0403-0543	2	2	EXTR-PC BD NAT NYL .093-IN-BD-THKNS	13103	5021-09N
A1P1	1251-7986	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7986
A1P2	1252-1546	7	1	CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A1P3	1250-2052	8	3	CONNECTOR-RF SM-SNP M PC	00779	221162-1
A1P4	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A1P5	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A1Q1	1854-0246	8	2	TRANSISTOR NPN SI TO-92 PD=350MW	04713	SPS 233
A1Q2	1854-0215	1	2	TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904
A1Q3	1854-0246	8		TRANSISTOR NPN SI TO-92 PD=350MW	04713	SPS 233
A1Q4	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A1Q5	1854-0215	1		TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904
A1Q6	1853-0036	2	1	TRANSISTOR PNP SI PD=310MW FT=250MHZ	27014	2N3906
A1R1	0698-3442	9	7	RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R2	0757-0428	1	7	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R3	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3481-F
A1R4	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3481-F
A1R5	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R6	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R7	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R8	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R9	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2610-F
A1R10	0698-3156	2	5	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A1R11	0698-3150	6	2	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
A1R12	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2610-F
A1R13	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A1R14	0757-0280	3	13	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R15	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R16	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R18	0698-8961	7	2	RESISTOR 909K 1% .125W F TC=0+-100	28480	0698-8961
A1R19	0698-3441	8	8	RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R21	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R22	0757-0438	3	14	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R23	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R24	1810-0203	5	3	NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81-R470
A1R25	0698-0082	7	4	RESISTOR 464 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4640-F
A1R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R27	0757-0420	3	4	RESISTOR 750 1% .125W F TC=0+-100	24546	CT4-1/8-T0-751-F
A1R28	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4640-F
A1R29	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R31	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A1R32	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4641-F
A1R33	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A1R34	0757-0458	7	2	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5112-F
A1R35	0698-3161	9	1	RESISTOR 38.3K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3832-F
A1R36	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R37	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5112-F
A1R38	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R39	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R40	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R41	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R42	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2610-F
A1R43	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A1R44	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
A1R45	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2610-F
A1R46	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A1R47	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R48	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R49	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R50	0698-8961	7		RESISTOR 909K 1% .125W F TC=0+-100	28480	0698-8961

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1R51	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R52	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R53	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A1R54	1810-0204	6	1	NETWORK-RES 8-SIP 1.0K OHM X 7	11236	750-81-R1K
A1R55	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81-R470
A1R56	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81-R470
A1R57	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R58	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R59	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R60	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R61	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R62	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4641-F
A1R63	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	CT4-1/8-T0-751-F
A1R64	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	CT4-1/8-T0-751-F
A1R65	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	CT4-1/8-T0-751-F
A1R66	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4640-F
A1R67	0757-0397	3	2	RESISTOR 68.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-68R1-F
A1R68	0698-4037	0	2	RESISTOR 46.4 1% .125W F TC=0+-100	28480	0698-4037
A1R69	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	5033R-1/8-T0-6191-F
A1R70	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A1R71	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4640-F
A1R72	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-68R1-F
A1R73	0698-4037	0		RESISTOR 46.4 1% .125W F TC=0+-100	28480	0698-4037
A1R74	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R75	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R76	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R77	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R78	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R79	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R80	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R81	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R82	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R83	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A1R84	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A1R85	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+-100	24546	CT4-1/8-T0-511R-F
A1R86	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	CT4-1/8-T0-511R-F
A1R87	0698-3162	0	2	RESISTOR 46.4K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4642-F
A1R88	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A1R89	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	CT4-1/8-T0-511R-F
A1R90	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	CT4-1/8-T0-511R-F
A1R91	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4642-F
A1R92	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A1R93	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R94	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R95	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81-R4.7K
A1R96	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1621-F
A1R97	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A1R98-A1R200				NOT ASSIGNED		
A1R201	0699-1542	8	1	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A1U1	1826-0527	9	3	IC 337 V RGLTR TO-220	27014	LM337T
A1U2	1826-0527	9		IC 337 V RGLTR TO-220	27014	LM337T
A1U3	1826-0393	7	3	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A1U4	1826-0175	3	2	IC COMPARATOR GP DUAL 14-DIP-P PKG	27014	LM319N
A1U5	1820-1965	9	2	IC GATE CMOS NOR TPL 3-INP	04713	MC14025BCP
A1U6	1820-2488	3	4	IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A1U7	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A1U8	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A1U9	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A1U10	1826-0180	0	1	IC TIMER TTL MONO/ASTBL	18324	NE555N
A1U11	1820-0821	4	1	IC CNTR ECL BIN UP/DOWN SYNCHRO	04713	MC10136L
A1U12	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A1U13	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A1U14	1826-0393	7		IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A1U15	1826-0412	1	2	IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N

See introduction to this section for ordering information
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Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A1U16	1826-0175	3		IC COMPARATOR GP DUAL 14-DIP-P PKG	27014	LM319N
A1U17	1820-1965	9		IC GATE CMOS NOR TPL 3-INP	04713	MC14025BCP
A1U18	1820-2889	8	1	IC GATE TTL ALS AND TPL 3-INP	01295	SN74ALS11N
A1U19	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A1U20	1820-3394	2	1	IC GATE TTL ALS AND QUAD 2-INP	01295	SN74ALS09N
A1U21	05371-80022	8	1	PAL ADDRESS DECC	28480	05371-80022
A1U22	1826-0412	1		IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N
A1U23	1820-1300	6	1	IC SHF-RGTR TTL LS R-S PRL-IN PRL-OUT	01295	SN74LS195AN
A1U24	1820-0624	5	1	IC COMPTR ECL A/D DUAL	04713	MC1651L
A1U25	1820-1052	5	1	IC XLTR ECL ECL-TO-TTL QUAD 2-INP	04713	MC10125L
A1U26	1826-0393	7		IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A1U27	1820-3100	8	2	IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A1U28	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A1U29	1820-3707	1	3	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A1U30	1820-3707	1		IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A1U31	1820-3707	1		IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A1U32	1826-0772	6	1	IC V RGLTR-ADJ-POS 1.2/32V TO-92 PKG	28480	1826-0772
A1U33	1826-0527	9		IC 337 V RGLTR TO-220	27014	LM337T

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A2	05371-60002	2	1	INPUT AMPLIFIER BOARD ASSEMBLY (DATE CODE 88265)	28480	05371-60002
A2C1	0180-2207	5	2	CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A2C2	0160-0576	5	18	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C3	0180-0098	8	2	CAPACITOR-FXD 100UF+-20% 20VDC TA	56289	150D107X0020S2
A2C4	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C5	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C7	0180-0098	8		CAPACITOR-FXD 100UF+-20% 20VDC TA	56289	150D107X0020S2
A2C8	0160-4371	6	4	CAPACITOR-FXD 680PF +-5% 100VDC CER	28480	0160-4371
A2C9	0160-3879	7	6	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C10	0180-3847	1	4	CAPACITOR-FXD 22UF+-10% 25VDC TA	28480	0180-3847
A2C11	0160-4040	6	2	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A2C12	0180-3941	6	2	CAAPACITOR-FXD 100UF+-10% 10VDC TA	28480	0180-3941
A2C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C15	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C16	0160-4371	6		CAPACITOR-FXD 680PF +-5% 100VDC CER	28480	0160-4371
A2C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C18	0160-3728	5	4	CAPACITOR-FXD .01UF +-20% 50VDC CER	51959	1005X103M2P
A2C19	0160-3728	5		CAPACITOR-FXD .01UF +-20% 50VDC CER	51959	1005X103M2P
A2C20	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C21	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C22	0180-3775	4	4	CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A2C23	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A2C24	0180-3847	1		CAPACITOR-FXD 22UF+-10% 25VDC TA	28480	0180-3847
A2C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C30	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C31	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A2C32	0180-3941	6		CAAPACITOR-FXD 100UF+-10% 10VDC TA	28480	0180-3941
A2C33	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C34	0160-4371	6		CAPACITOR-FXD 680PF +-5% 100VDC CER	28480	0160-4371
A2C35	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C36	0160-4371	6		CAPACITOR-FXD 680PF +-5% 100VDC CER	28480	0160-4371
A2C37	0180-3847	1		CAPACITOR-FXD 22UF+-10% 25VDC TA	28480	0180-3847
A2C38	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2C41	0160-3728	5		CAPACITOR-FXD .01UF +-20% 50VDC CER	51959	1005X103M2P
A2C42	0160-3728	5		CAPACITOR-FXD .01UF +-20% 50VDC CER	51959	1005X103M2P
A2C43	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C44	0160-3875	3	2	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A2C45	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A2C46	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A2C47	0180-3847	1		CAPACITOR-FXD 22UF+-10% 25VDC TA	28480	0180-3847
A2C48	0180-3771	0	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A2C49	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A2C50	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C51	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A2CR1	1902-0959	3	2	DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.076%	28480	1902-0959
A2CR2	1902-0956	0	2	DIODE-ZNR 8.2V 5% DO-35 PD=.4W TC=+.065%	28480	1902-0956
A2CR3	1902-0953	7	2	DIODE-ZNR 6.2V 5% DO-35 PD=.4W TC=+.053%	28480	1902-0953
A2CR4	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2CR5	1902-0945	7	4	DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A2CR6	1902-0945	7		DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A2CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2CR8	1902-0959	3		DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.076%	28480	1902-0959
A2CR9	1902-0953	7		DIODE-ZNR 6.2V 5% DO-35 PD=.4W TC=+.053%	28480	1902-0953
A2CR10	1902-0945	7		DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A2CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2CR13	1902-0945	7		DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A2CR14	1902-0956	0		DIODE-ZNR 8.2V 5% DO-35 PD=.4W TC=+.065%	28480	1902-0956
A2H1	0515-0659	8	16	SCREW-MACHINE ASSEMBLY M2 X 0.4 8MM-LG	00000	ORDER BY DESCRIPTION
A2H2	05371-20201	9	4	HEATSINK	28480	05371-20201
A2H3	3050-0098	6	2	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098
A2H4	0380-1731	2	16	SPACER-PRESS-IN 1.70 MM LG; 2.38 MM ID	46384	YC3-4564
A2J1	1250-1675	9	2	CONNECTOR-RF SMA FEM PC 50-OHM	28480	1250-1675
A2J2	1250-0835	1	2	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A2J3	1250-1675	9		CONNECTOR-RF SMA FEM PC 50-OHM	28480	1250-1675
A2J4	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A2K1	0490-1554	0	8	RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K2	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K3	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K4	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K5	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K6	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K7	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2K8	0490-1554	0		RELAY 1C 5VDC-COIL .01A 24VDC	5N615	G5Y-154P-5VDC
A2L1	9140-1170	4	9	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L3	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L4	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L5	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L6	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L7	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L8	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2L9	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A2MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A2MP2	54100-29101	2	4	SPRING-HYBRID	28480	54100-29101
A2MP3	54100-29104	5	4	CLAMP-HYBRID	28480	54100-29104
A2MP4	0340-0864	6	1	INSULATOR-XSTR THRM-CNDCT	28480	0340-0864
A2P1	1251-7986	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7986
A2P2	1252-1546	7	1	CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A2Q1	1853-0314	9	4	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A2Q2	1854-0090	0	4	TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	25403	2N3053LV 2449
A2Q3	1854-0686	0	4	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A2Q4	1854-0092	2	4	TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A2Q5	1854-0092	2		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A2Q6	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A2Q7	1854-0090	0		TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	25403	2N3053LV 2449
A2Q8	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A2Q9	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A2Q10	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A2Q11	1854-0092	2		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A2Q12	1854-0092	2		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A2Q13	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A2Q14	1854-0090	0		TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	25403	2N3053LV 2449
A2Q15	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A2Q16	1854-0090	0		TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	25403	2N3053LV 2449
A2R1	2100-3056	8	2	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A2R2	2100-3154	7	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	73138	89PR1K
A2R3	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A2R4	2100-3154	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	73138	89PR1K
A2R5	0698-3446	3	4	RESISTOR 383 1% .125W F TC=0+-100	24546	CT4-1/8-T0-383R-F
A2R6	0698-7196	8	3	RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
A2R7	0698-3613	6	4	RESISTOR 39 5% 2W MO TC=0+-200	27167	FP42-2-T00-39R0-J
A2R8	0698-7212	9	8	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R9	0698-7254	9	4	RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A2R10	2100-3161	6	2	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	73138	89PR20K

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2R11	2100-3161	6		RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	73138	89PR20K
A2R12	2100-3103	6	2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	73138	89PR10K
A2R13	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	73138	89PR10K
A2R14	2100-3109	2	2	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	73138	89PR2K
A2R15	2100-3109	2		RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	73138	89PR2K
A2R16	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	CT4-1/8-T0-383R-F
A2R17	0698-7196	8		RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
A2R18	0698-3613	6		RESISTOR 39 5% 2W MO TC=0+-200	27167	FP42-2-T00-39R0-J
A2R19	0699-1320	0	4	RESISTOR 19.6K 1% .125W F TC=0+-100	28480	0699-1320
A2R20	0699-2358	6	2	RESISTOR 68 1% .125W TF TC0=+-50	28480	0699-2358
A2R21	0699-2263	2	4	RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A2R22	0698-7246	9	2	RESISTOR 2.61K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2611-F
A2R23	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A2R24	0699-1320	0		RESISTOR 19.6K 1% .125W F TC=0+-100	28480	0699-1320
A2R25	0699-2245	0	2	RESISTOR 1K 1% .125W TF TC=0+-50	28480	0699-2245
A2R26	0699-1542	8	16	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R27	0699-2263	2		RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A2R28	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R29	0698-7234	5	2	RESISTOR 825 1% .05W F TC=0+-100	24546	C3-1/8-T0-825R-F
A2R30	0698-7256	1	3	RESISTOR 6.81K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6811-F
A2R31	0698-7232	3	2	RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-T0-681R-F
A2R32	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R33	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A2R34	0698-7262	9	2	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
A2R35	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R36	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R37	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R38	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R39	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R40	0699-2281	4	2	RESISTOR 330 1% .125W TF TC=0+-50	28480	0699-2281
A2R41	0698-7236	7	5	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A2R42	0699-1769	1	2	RESISTOR 51 1% .25W TF TC=0+-50	28480	0699-1769
A2R43	0698-7220	9	7	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R44	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R45	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R46	0698-7260	7	12	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R47	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R48	0698-7188	8	4	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A2R49	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A2R50	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R51	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R52	0698-7254	9		RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A2R53	0699-2358	6		RESISTOR 68 1% .125W TF TC0=+-50	28480	0699-2358
A2R54	0698-7246	9		RESISTOR 2.61K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2611-F
A2R55	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A2R56	0698-7234	5		RESISTOR 825 1% .05W F TC=0+-100	24546	C3-1/8-T0-825R-F
A2R57	0699-2263	2		RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A2R58	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R59	0698-7256	1		RESISTOR 6.81K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6811-F
A2R60	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R61	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A2R62	0698-3613	6		RESISTOR 39 5% 2W MO TC=0+-200	27167	FP42-2-T00-39R0-J
A2R63	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R64				NOT ASSIGNED		
A2R65	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R66	0699-2263	2		RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A2R67	0699-2245	0		RESISTOR 1K 1% .125W TF TC=0+-50	28480	0699-2245
A2R68	0698-7256	1		RESISTOR 6.81K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6811-F
A2R69	0698-7232	3		RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-T0-681R-F
A2R70	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R71	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A2R72	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R73	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R74	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R75	0699-2281	4		RESISTOR 330 1% .125W TF TC=0+-50	28480	0699-2281

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2R76	0698-7262	9		RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
A2R77	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R78	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A2R79	0699-1320	0		RESISTOR 19.6K 1% .125W F TC=0+-100	28480	0699-1320
A2R80	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A2R81	0698-7196	8		RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
A2R82	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	CT4-1/8-T0-383R-F
A2R83	0699-1320	0		RESISTOR 19.6K 1% .125W F TC=0+-100	28480	0699-1320
A2R84	0698-7257	2	2	RESISTOR 7.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-7501-F
A2R85	0698-7254	9		RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A2R86	0698-6360	6	2	RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A2R87	0698-7237	8	3	RESISTOR 1.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1101-F
A2R88	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R89	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A2R90	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A2R91	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A2R92	0699-1769	1		RESISTOR 51 1% .25W TF TC=0+-50	28480	0699-1769
A2R93	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R94	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R95	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R96	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R97	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R98	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R99	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2R100	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A2R101	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R102	0698-8812	7	1	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A2R103	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R104	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R105	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R106	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R107	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R108	0698-7237	8		RESISTOR 1.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1101-F
A2R109	0698-7235	6	1	RESISTOR 909 1% .05W F TC=0+-100	24546	C3-1/8-T0-909R-F
A2R110	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A2R111	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A2R112	0698-3613	6		RESISTOR 39 5% 2W MO TC=0+-200	27167	FP42-2-T00-39R0-J
A2R113	0698-3430	5	1	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A2R114	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	CT4-1/8-T0-383R-F
A2R115	0698-7237	8		RESISTOR 1.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1101-F
A2R116	0698-7254	9		RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A2R117	0698-7257	2		RESISTOR 7.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-7501-F
A2R118	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A2R119				NOT ASSIGNED		
A2R120	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A2U1	0955-0404	3	2	U-WAVE ATTENUATOR 1.5 GHZ MAX	15542	AT-8
A2U2	1NB7-8076	3	2	DCOFFSET HYBRID	28480	1NB7-8076
A2U3	1826-0275	4	2	IC 78L12A V RGLTR TO-92	04713	MC78L12ACP
A2U4	1NB7-8109	3	2	SYNC COMP HYBRID	28480	1NB7-8109
A2U5	1820-2000	5	2	IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A2U6	1826-0311	9	2	IC OP AMP GP 8-DIP-P PKG	04713	MLM201AP1
A2U7	1826-0609	8	2	IC MULTIPLXR ANLG 16-DIP-C PKG	06665	MUX08FQ
A2U8	1826-1049	2	2	IC OP AMP PRCN 8-DIP-C PKG	06665	OP-27GZ
A2U9	1826-0282	3	2	IC V RGLTR TO-92	04713	MC79L12ACP
A2U10	1826-0285	6	2	IC V RGLTR TO-92	04713	MC79L05C
A2U11	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A2U12	1820-2656	7	1	IC GATE TTL ALS NAND QUAD 2-INP	01295	SN74ALS00AN
A2U13	0955-0404	3		U-WAVE ATTENUATOR 1.5 GHZ MAX	15542	AT-8
A2U14	1NB7-8076	3		DCOFFSET HYBRID	28480	1NB7-8076
A2U15	1NB7-8109	3		SYNC COMP HYBRID	28480	1NB7-8109
A2U16	1820-1730	6	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A2U17	1826-0275	4		IC 78L12A V RGLTR TO-92	04713	MC78L12ACP
A2U18	1826-0311	9		IC OP AMP GP 8-DIP-P PKG	04713	MLM201AP1
A2U19	1826-0635	0	2	IC OP AMP LOW-OFS 8-DIP-P PKG	06665	OP-07CP
A2U20	1826-1246	1	2	D/A 12-BIT 28-CERDIP BPLR	24355	AD41811

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2U21	1826-0609	8		IC MULTIPLXR ANLG 16-DIP-C PKG	06665	MUX08FQ
A2U22	1826-1049	2		IC OP AMP PRCN 8-DIP-C PKG	06665	OP-27GZ
A2U23	1826-0285	6		IC V RGLTR TO-92	04713	MC79L05C
A2U24	1826-0282	3		IC V RGLTR TO-92	04713	MC79L12ACP
A2U25	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A2U26	1820-2273	4	1	IC DRVR TTL PRPHL GP OCTL	13606	UDN-2981A
A2U27	1820-1730	6		I. FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A2U28	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2U29	1826-0635	0		IC OP AMP LOW-OFS 8-DIP-P PKG	06665	OP-07CP
A2U30	1826-1246	1		D/A 12-BIT 28-CERDIP BPLR	24355	AD41811

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4	05371-60004	4	1	INTERPOLATOR BOARD (DATE CODE 88265)	28480	05371-60004
A4C1	0160-3879	7	52	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C3	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C7	0180-3813	1	4	CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A4C8	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A4C9	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C12	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C13	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C14	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C15	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C17	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C21	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C22	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C23	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C24	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C26	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C27	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C28	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A4C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C31	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C33	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C34	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C35	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C36	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C37	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C38	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C39	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C42	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C43	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C44	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C45	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C46	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A4C47	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C48	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C49	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C50	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C51	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C52	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C53	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C54	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C55	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4C56	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A4CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4CR3	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A4CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A4CR6	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A4H1	3050-0098	6	1	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098
A4J1				NOT ASSIGNED		
A4J2	1250-0835	1	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A4L1	9140-1170	4	2	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A4L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A4MP1	0403-0543	2	2	EXTR-PC BD NAT NYL .093-IN-BD-THKNS	13103	5021-09N
A4P1	1251-7986	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7986
A4P2	1250-2052	8	4	CONNECTOR-RF SM-SNP M PC	00779	221162-1
A4P3	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A4P4	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A4P5	1252-1546	7	1	CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A4P6	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A4Q1	1854-0686	0	6	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q2	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q3	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q4	1854-0019	3	2	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A4Q5	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q6	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q7	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A4Q8	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A4R1	0699-1542	8	22	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R2	0699-1991	1	12	RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R3	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R4	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R5	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R6	2100-1984	7	2	RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	73138	82PR100
A4R7	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R8	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R9	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R10	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A4R11	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R12	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R13	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R14	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R15	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R16	0698-7220	9	2	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A4R17	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R18	0698-7236	7	2	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A4R19	2100-2061	3	18	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R20	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R21	0699-2253	0	18	RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R22	0698-7205	0	18	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R23	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R24	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R25	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R26	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R27	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R28	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R29	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R30	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R31	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R32	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R33	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R34	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R35	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R36	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R37	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R38	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R39	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A4R40	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4R41	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R42	0698-7190	2	2	RESISTOR 12.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-12R1-F
A4R43	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R44	0698-7219	6	2	RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-TO-196R-F
A4R45	1810-0366	1	2	NETWORK-RES 6-SIP 220.0 OHM X S	11236	750-61-R220
A4R46	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R47	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R48	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-215I-F
A4R49	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R50	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R51	0698-7225	4	1	RESISTOR 348 1% .05W F TC=0+-100	24546	C3-1/8-TO-348R-F
A4R52	0698-7222	1	2	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-TO-261R-F
A4R53	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R54	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R55	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R56	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R57	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R58	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R59	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R60	2100-1984	7		RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	73138	82PR100
A4R61	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R62	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R63	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R64	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-215I-F
A4R65	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R66	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A4R67	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R68	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R69	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R70	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-TO-215R-F
A4R71	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R72	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1001-F
A4R73	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R74	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R75	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R76	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R77	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R78	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R79	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R80	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R81	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R82	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R83	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-215I-F
A4R84	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R85	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R86	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-TO-261R-F
A4R87	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R88	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R89	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R90	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X S	11236	750-61-R220
A4R91	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-TO-196R-F
A4R92	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R93	0698-7190	2		RESISTOR 12.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-12R1-F
A4R94	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R95	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R96	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R97	2100-2061	3		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	82PR200
A4R98	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R99	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R100	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R101	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R102	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A4R103	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R104	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A4R105	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4R106- A4R199				NOT ASSIGNED		
A4R200	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4R201	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A4TP1A	1251-2229	3	2	CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	28480	1251-2229
A4TP1B	1251-4045	5	2	SOCKET-GROUND SPRING STEEL; 0.190IN ID	28480	1251-4045
A4TP2A	1251-2229	3		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	28480	1251-2229
A4TP2B	1251-4045	5		SOCKET-GROUND SPRING STEEL; 0.190IN ID	28480	1251-4045
A4U1	1820-2000	5	24	IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U2	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U3	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U4	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U5	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U6	1858-0055	5	8	TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U7	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U8	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U9	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U10	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U11	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U12	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U13	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U14	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U15	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U16	1820-3522	8	2	IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A4U17	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U18	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U19	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U20	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U21	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U22	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U23	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U24	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U25	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U26	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U27	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A4U28	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U29	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U30	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U31	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U32	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4U33	1820-2000	5		IC FF ECL D-M/S POS-EDGE-TRIG	28480	B196D-0100
A4U34	1858-0055	5		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2369
A4W1				NOT LOADED		
A4W2	8159-0005	0	4	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A4W3	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A4W4- A4W7				NOT LOADED		
A4W8	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A4W9	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5	05371-60027	9	1	ZDT/COUNT BOARD (DATE CODE 8839S)	28480	05371-60027
A5C1	0160-0576	5	87	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C2	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C3	0160-4389	6	3	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C4	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C5	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C8				NOT ASSIGNED		
A5C9				NOT ASSIGNED		
A5C10	0160-4554	7	6	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C11	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A5C12	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C13	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C15	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C16	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C17	0180-3775	4	3	CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A5C18	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A5C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C20				NOT ASSIGNED		
A5C21	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A5C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C23	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C24	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C25	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C29	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C30	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C31	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C32	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C33	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C34	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C35	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C36	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C37				NOT ASSIGNED		
A5C38	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C41	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C42	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C43	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C44	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C45	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C46	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C47	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C48	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C49	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C50	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C51	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C52	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C53	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C54	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C55	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C56	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C57	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C58	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C59	0160-4521	8	1	CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A5C60	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5C61	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C62				NOT ASSIGNED		
A5C63	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C64	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C65	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C66				NOT ASSIGNED		
A5C67	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C68	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C69	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C70	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C71	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C72	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C73	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C74				NOT ASSIGNED		
A5C75	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C76	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C77	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C78	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C79	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C80	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C81	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C82	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C83	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C84	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C85	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C86	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C87	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C88	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C89	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C90	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C91				NOT ASSIGNED		
A5C92	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C93	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C94	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C95	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C96	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C97	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C98	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C99	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C100	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C101-A5C299				NOT ASSIGNED		
A5C300	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C301	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR4	1901-0050	3		DIODE SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5H1	3050-0098	6	4	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098
A5J1	1250-0835		2	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A5J2	1252-1035	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1252-1035
A5J3	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A5J3	1258-0141	1		CONNECTOR-JUMPER	28480	1258-0141
A5L1	9140-1170	4	3	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5L3	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5P1- A5P3				NOT ASSIGNED		
A5P4	1252-1546	7	2	CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A5P5				NOT ASSIGNED		
A5P6				NOT ASSIGNED		
A5P7				NOT ASSIGNED		
A5P8	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P9	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P10	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P11	1252-1546	7		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A5P12	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5R1	0698-7205	0	4	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A5R2	1810-0366	1	12	NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R3	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R4	1810-0270	6	6	NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R5	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R6	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R7	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R8	1810-1070	6	3	NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R9	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R10	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R11	0699-2253	0	8	RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R12	0699-2252	9	8	RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R13	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R14	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R15	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R16	0698-7220	9	2	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-TO-215R-F
A5R17	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-2151-F
A5R18	1810-0275	1	6	NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R19	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-2151-F
A5R20				NOT ASSIGNED		
A5R21				NOT ASSIGNED		
A5R22	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R23	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R24				NOT ASSIGNED		
A5R25	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R26	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R27	0698-8819	4	1	RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A5R28	1810-1070	6		NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R29	0698-3439	4	2	RESISTOR 178 1% .125W F TC=0+-100	24546	CT4-1/8-T0-178R-F
A5R30	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R31	0699-1542	8	7	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R32	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R33	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R34	0699-1542	8	7	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R35	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R36	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R37	0699-1542	8	7	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R38	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R39	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R40	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R41	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R42	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R43	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R44	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R45	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R46	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R47	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R48	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R49	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R50	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R51	0699-2254	1	1	RESISTOR 470 1% .125W TF TC=0+-50	28480	0699-2254
A5R52	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A5R53	1810-1070	6		NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R54	0698-8820	7	1	RESISTOR 4.64 1% .125W F TC=0+-100	28480	0698-8820
A5R55	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0+-100	24546	CT4-1/8-T0-111-F

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5R56				NOT ASSIGNED		
A5R57	0698-3439	4		RESISTOR 178 1% .125W F TC=0+-100	24546	CT4-1/8-T0-178R-F
A5R58	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R59	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R60	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R61	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R62	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R63				NOT ASSIGNED		
A5R64	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R65	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R66	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R67	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R68	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A5R69	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R70	0698-3438	3	2	RESISTOR 147 1% .125W F TC=0+-100	24546	CT4-1/8-T0-147R-F
A5R71-A5R300				NOT ASSIGNED		
A5R301	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R302				NOT ASSIGNED		
A5R303	0698-3438	3		RESISTOR 147 1% .125W TC=0+-100	24546	CT4-1/8-T0-147R-F
A5R304-A5R399				NOT ASSIGNED		
A5R400	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R401	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R402	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R403	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R404-A5R407				NOT ASSIGNED		
A5R408	0699-2263	2	2	RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A5R409	0699-2263	2		RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A5R410-A5R599				NOT ASSIGNED		
A5R600	0757-0346	2	6	RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R601	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R602	2100-3751	2	3	RESISTOR VARIABLE 10 17 TURN	28480	2100-3751
A5R603	2100-3751	2	3	RESISTOR VARIABLE 10 17 TURN	28480	2100-3751
A5R604	0757-0346	2	6	RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R605	0757-0346	2	6	RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R606	2100-3751	2	3	RESISTOR VARIABLE 10 17 TURN	28480	2100-3751
A5R607	0757-0346	2	6	RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R608	0757-0346	2	6	RESISTOR 10 1% .125W TF TC=0+-50	28480	0757-0346
A5R609-A5R700				NOT ASSIGNED		
A5R701	0698-7228	7	3	RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R702	0698-7228	7		RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R703	0698-7228	7		RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R704	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5U1	1820-4318	2	2	IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N
A5U2	1820-3522	8	3	IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U3	1820-3521	7	1	IC XLTR ECL/10KH TTL-TO-ECL QUAD	04713	MC10H124L
A5U4	1820-2849	7	2	IC FF ECL/10KH D-M/S COM CLOCK DUAL	28480	1820-2849
A5U5	1820-4318	2		IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N
A5U6	1820-3481	8	15	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U7	1820-2849	7		IC FF ECL/10KH D-M/S COM CLOCK DUAL	28480	1820-02849
A5U8	1820-3337	3	2	IC GATE ECL/10KH AND QUAD 2-INP	04713	MC10H104P
A5U9	1820-2962	8	1	IC GATE ECL/10KH OR QUAD 2-INP	04713	MC10H103P
A5U10	1818-4134	8	12	IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U11	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U12	1820-3102	0	1	IC CNTR ECL/10KH BIN SYNCHRO 4-BIT	04713	MC10H016L
A5U13	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U14	1820-3337	3		IC GATE ECL/10KH AND QUAD 2-INP	04713	MC10H104P
A5U15	1DK5-0001	6	6	IC:ZERO DEAD TIM	28480	1DK5-0001
A5U16	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U17	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U18	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U19	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U20				NOT ASSIGNED		

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5U21	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U22	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U23	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U24	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U25	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U26	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U27	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U28	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U29	1DK6-0001	8	1	IC:SEQUENCER	28480	1DK6-0001
A5U30	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U31	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U32	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U33	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U34	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U35				NOT ASSIGNED		
A5U36	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U37	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U38	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U39	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U40	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U41	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U42	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U43	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U44	1818-4134	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	28480	1818-4134
A5U45	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U46	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U47	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U48-A5R99				NOT ASSIGNED		
A5U100	1820-2849	7	2	IC FF ECL/10KH D-M/S COM CLOCK DUAL	04713	MC10H131L
A5U101	1820-2849	7	2	IC FF ECL/10KH D-M/S COM CLOCK DUAL	04713	MC10H131L
A5U102	1820-2956	0	1	IC GATE ECL/10KH EXCL-OR/NOR TPL 2-INP	04713	MC10H107P
A5W1	05371-60218	2	2	CBL ASSY COUNT	28480	05371-60218
A5W2	05371-60218	2		CBL ASSY COUNT	28480	05371-60218
A5XU15	1200-1372	8	7	SKT-PGAT2PINPCMT	28480	1200-1372
A5XU22	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU27	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU28	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU29	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU30	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU40	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6	05371-60018	0	1	DMA/GATE BOARD (DATE CODE 88265)	28480	05371-60018
A6C1	0160-4557	0	41	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C2	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C4	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C5	0160-4350	1	1	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
A6C6				NOT ASSIGNED		
A6C7				NOT ASSIGNED		
A6C8	0160-4387	4	1	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A6C9	0160-0576	5	9	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C10	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C12	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C13	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C14	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C16	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C18	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C19	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A6C20	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C21-A6C23				NOT ASSIGNED		
A6C24	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C25	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C27				NOT ASSIGNED		
A6C28				NOT ASSIGNED		
A6C29	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C30	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C31	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C32	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C33	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C34	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C35	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C36	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C37	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C38	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C39				NOT ASSIGNED		
A6C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C41				NOT ASSIGNED		
A6C42				NOT ASSIGNED		
A6C43	0180-3775	4	6	CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6C44	0180-3831	3	4	CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A6C45	0180-3813	1	2	CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A6C46	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C47-A6C51				NOT ASSIGNED		
A6C52	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C53	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C54	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C55	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6C56	0160-4554	7	2	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A6C57				NOT ASSIGNED		
A6C58	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C59	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A6C60	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C61	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C62	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C63	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C64	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6C65	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C66	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C67	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C68	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C69	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C70	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A6C71	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C72	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C73-A6C99				NOT ASSIGNED		
A6C100	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A6C101	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A6C102	0180-3831	3		CAPACITOR-FXD 10UF+-10% 35VDC TA	56289	299D106X9035DB1
A6C103	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C104	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6C105-A6C107				NOT ASSIGNED		
A6C108	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A6C109				NOT ASSIGNED		
A6C110	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C111	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A6C112-A6C199				NOT ASSIGNED		
A6C200	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6C201	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6C202	0180-3775	4		CAPACITOR-FXD 68UF-+20% 10VDC TA	28480	0180-3775
A6CR1,CR2				NOT ASSIGNED		
A6CR3	1901-0376	6	2	DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A6CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A6CR5	1902-0955	9	2	DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.062%	28480	1902-0955
A6CR6-A6CR19				NOT ASSIGNED		
A6CR20	1902-0955	9		DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.062%	28480	1902-0955
A6CR21-A6CR29				NOT ASSIGNED		
A6CR30	1902-0960	6	2	DIODE-ZNR 12V 5% DO-35 PD=.4W TC=+.077%	11707	1N963B
A6CR31	1902-0960	6		DIODE-ZNR 12V 5% DO-35 PD=.4W TC=+.077%	11707	1N963B
A6E1	9170-0029	9	1	INDUCTOR-FIXED BEAD	28480	9170-0029
A6J1	1252-1035	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1252-1035
A6J2	1250-0257	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A6J3	1251-4682	6	1	CONNECTOR 3-PIN M POST TYPE	28480	1251-4682
A6L1	9140-1170	4	6	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6L3	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6L4	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6L5	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6L6-A6L107				NOT ASSIGNED		
A6L108	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A6MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A6P1	1252-0020	0	1	CONN-POST TYPE .100-PIN-SPCG 140-CONT	28480	1252-0020
A6Q1	1855-0327	8	1	TRANSISTOR J-FET 2N4416 N-CHAN D-MODE	01295	2N4416
A6Q2	1854-0795	2	1	TRANSISTOR NPN SI TO-92 PD=625MW	04713	MPSH10
A6Q3	1854-0048	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	04713	1854-0048
A6R1	0757-0280	3	7	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R2	1810-0318	3	8	NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R3	0698-7198	0	1	RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-26R1-F
A6R4	0698-3266	5	1	RESISTOR 237K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2373-F
A6R5	0698-7222	1	1	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-TO-261R-F
A6R6	1810-0366	1	8	NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R7	0698-3442	9	4	RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A6R8	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R9	0698-3455	4	1	RESISTOR 261K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2613-F
A6R10	0698-8957	1	1	RESISTOR 500K 1% .125W F TC=0+-100	28480	0698-8957

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6R11	0698-8960	6	1	RESISTOR 750K 1% .125W F TC=0+-100	28480	0698-8960
A6R12	0698-7212	9	2	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A6R13				NOT ASSIGNED		
A6R14	0698-7229	8	5	RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A6R15	0699-0073	8	1	RESISTOR 10M 1% .125W F TC=0+-150	28480	0699-0073
A6R16	0698-7205	0	2	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A6R17	0698-7260	7	1	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A6R18	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A6R19	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R20	0698-8958	2	1	RESISTOR 511K 1% .125W F TC=0+-100	28480	0698-8958
A6R21	0698-7257	2	1	RESISTOR 7.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-7501-F
A6R22				NOT ASSIGNED		
A6R23	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1101-F
A6R24	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R25	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A6R26				NOT ASSIGNED		
A6R27	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A6R28	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R29	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R31	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R32	0698-7255	0	1	RESISTOR 6.19K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6191-F
A6R33	0698-7204	9	1	RESISTOR 46.4 1% .05W F TC=0+-100	24546	C3-1/8-T0-46R4-F
A6R34				NOT ASSIGNED		
A6R35	0698-7220	9	3	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A6R36	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A6R37	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A6R38				NOT ASSIGNED		
A6R39	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R40	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R41	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R42	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R43	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R44	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R45	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A6R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R47	0698-3150	6	2	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
A6R48	0698-7231	2	2	RESISTOR 619 1% .05W F TC=0+-100	24546	C3-1/8-T0-619R-F
A6R49	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
A6R50	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A6R51	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R52	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A6R53	0698-7228	7	1	RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-T0-464R-F
A6R54	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1961-F
A6R55	0698-7236	7	3	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A6R56	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A6R57	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R58	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R59	0698-7243	6	1	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A6R60	0698-7256	1	1	RESISTOR 6.81K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6811-F
A6R61	0698-7231	2		RESISTOR 619 1% .05W F TC=0+-100	24546	C3-1/8-T0-619R-F
A6R62	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A6R63	0698-7221	0	1	RESISTOR 237 1% .05W F TC=0+-100	24546	C3-1/8-T0-237R-F
A6R64-A6R99				NOT ASSIGNED		
A6R100	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A6R101	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A6R102	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0+-100	24546	CT4-1/8-T0-121R-F
A6R103	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A6R104	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A6R105	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A6R106	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A6R107-A6R199				NOT ASSIGNED		
A6R200	0698-8812	0	1	RESISTOR-ONE OHM1% .12 W F	28480	0698-8812
A6R300	0757-0399	0	1	RESISTOR-FIXED 82.5 1% .125W TF TC =0+-100	19701	0757-0399
A6R301	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0+-100	24546	CT4-1/8-T0-121R-F

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A6TP1				NOT ASSIGNED		
A6TP2	0360-1682	0	1	TERMINAL-STUD SGL-TUR PRESS-MTG	28480	0360-1682
A6U1	1820-2488	3	5	IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A6U2	1820-2889	8	1	IC GATE TTL ALS AND TPL 3-INP	01295	SN74ALS11N
A6U3	1820-2635	2	1	IC GATE TTL ALS AND QUAD 2-INP	01295	SN74ALS08N
A6U4				NOT ASSIGNED		
A6U5				NOT ASSIGNED		
A6U6	1820-2634	1	1	IC INV TTL ALS HEX	01295	SN74ALS04BN
A6U7	1810-1019	3	1	DELAY LINE ACTIVE DEVICE W/DUAL IN-LINE	92912	0447-0050-10
A6U8				NOT ASSIGNED		
A6U9	1820-2760	4	4	IC CNTR TTL F BIN UP/DOWN SYNCHRO	07263	74F191PC
A6U10	1820-2760	4		IC CNTR TTL F BIN UP/DOWN SYNCHRO	07263	74F191PC
A6U11	1820-2760	4		IC CNTR TTL F BIN UP/DOWN SYNCHRO	07263	74F191PC
A6U12	1820-2760	4		IC CNTR TTL F BIN UP/DOWN SYNCHRO	07263	74F191PC
A6U13	1820-3481	8	4	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A6U14	1820-3707	1	2	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A6U15	1820-3100	8	1	IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A6U16	05371-80017	1	1	PAL MISC DECODE	28480	05371-80017
A6U17	05371-80018	2	1	PAL ZDT ENABLE	28480	05371-80018
A6U18	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A6U19	1820-4350	2	1	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS241AN
A6U20	1820-3505	7	1	IC CNTR TTL ALS DECD UP/DOWN SYNCHRO	01295	SN74ALS191N
A6U21	1820-3438	5	1	IC MUXR/DATA-SEL TTL ALS 2-TO-1-LINE	01295	SN74ALS257N
A6U22	05371-80019	3	1	PAL INTERUPT	28480	05371-80019
A6U23	1820-2657	8	1	IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A6U24				NOT ASSIGNED		
A6U25				NOT ASSIGNED		
A6U26	1826-0493	8	1	IC OP AMP LOW-BIAS-H-IMPD 8-DIP-P PKG	04713	MLM308AP1
A6U27	1820-2757	9	4	IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	SN74ALS574AN
A6U28	1820-4318	2	2	IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N
A6U29	1820-2757	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	SN74ALS574AN
A6U30	1820-4318	2		IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N
A6U31	1820-2757	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	SN74ALS574AN
A6U32	1820-3493	2	1	IC FF TTL AS D-TYPE POS-EDGE-TRIG	01295	SN74AS74N
A6U33	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A6U34	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A6U35	1820-2692		1	IC GATE TTL F EXCL-OR QUAD 2-INP	07263	74F86PC
A6U36	05371-80020	6	1	PAL BUFFER ENABL	28480	05371-80020
A6U37	1818-4263	8	2	IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C45
A6U38	1818-4263	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C45
A6U39	1820-3143	9	1	IC FF TTL ALS D-TYPE POS-EDGE-TRIG DUAL	01295	SN74ALS874NT
A6U40	1820-2757	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	SN74ALS574AN
A6U41	1820-2705	7	1	IC-8-BIT/16-BIT SYSTEM TIMING CONTROLLER	28480	1820-2705
A6U42	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A6U43	1826-0426	7	1	IC COMPARATOR HS DUAL 16-DIP-C PKG	34335	AM687A0L
A6U44	1820-2956	0	1	IC GATE ECL/10KH EXCL-OR/NOR TPL 2-INP	04713	MC10H107P
A6U45	1826-0346	0	1	IC OP AMP GP DUAL 8-DIP-P PKG	27014	LM358N
A6U46	1826-0639	4	1	D/A 8-BIT 16-PLASTIC CMOS	24355	AD7524JN
A6U47	1820-3521	7	3	IC XLTR ECL/10KH TTL-TO-ECL QUAD	04713	MC10H124L
A6U48	1820-3748	0	1	IC MUXR/DATA-SEL TTL AS 2-TO-1-LINE QUAD	01295	SN74AS257N
A6U49	1820-3521	7		IC XLTR ECL/10KH TTL-TO-ECL QUAD	04713	MC10H124L
A6U50	1820-3522	8	3	IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A6U51	1820-3521	7		IC XLTR ECL/10KH TTL-TO-ECL QUAD	04713	MC10H124L
A6U52	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A6U53	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A6U54	1820-3707	1		IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A6U55	05371-80023	9	1	PAL RAM ENABLE	28480	05371-80023
A6U56	1820-1568	8	1	IC BFR TTL LS BUS QUAD	01295	SN74LS125AN
A6U57	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A6U58	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A6U59	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A6U60	1858-0040	8	1	TRANSISTOR ARRAY 16-PIN PLSTC DIP	3L585	CA3127E
A6U61	1820-3692	3	1	IC ANLG-MUXR/DEMUXR CMOS/74HC 2-CHANNEL	27014	MM74HC4053N
A6U62	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A7	05371-60007	7	1	PROCESSOR BOARD (DATE CODE 88265)	28480	05371-60007
A7BT1	1420-0331	3	1	BATTERY 3.4V 1.75A-HR LITHIUM THIONYL	28480	1420-0331
A7C1	0160-4557	0	39	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C2	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C4	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C5	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C6	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C7	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C8	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C9	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C10	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C12	0180-3813	1	2	CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A7C13	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C14	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C16	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C18	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C19	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C20	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C21	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C22	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C23	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C24	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C25	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C26	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C27	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C28	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C29	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C30	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C31	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C32	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C33	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C34	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C35	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C36	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C37	0160-4787	8	2	CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	28480	0160-4787
A7C38	0160-4787	8		CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	28480	0160-4787
A7C39	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C40	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C41	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C42	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A7C43	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A7C44-A7C99				NOT ASSIGNED		
A7C100	0160-4801	7	2	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A7C101	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A7CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7CR2	1902-0952	6	1	DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A7CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7CR4	1901-0999	9	1	DIODE-SCHOTTKY 20V 10NS DO-35	14433	SD103C
A7CR5	1901-0518	8	1	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A7DS1	1990-0979	2	1	LED-LAMP ARRAY IF=30MA-MAX BVR=5V	28480	HLMP-6856

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7J1	1251-6073	3	3	CONNECTOR 2-PIN M POST TYPE	28480	1251-6073
A7J2	1251-6073	3		CONNECTOR 2-PIN M POST TYPE	28480	1251-6073
A7J3	1251-4682	6	1	CONNECTOR 3-PIN M POST TYPE	28480	1251-4682
A7J4	1251-4682	6	1	CONNECTOR 3-PIN M POST TYPE	28480	1251-4682
A7J5	1252-0169	8	2	CONN-POST TYPE .100-PIN-SPCG 24-CONT	28480	1252-0169
A7J6	1252-0169	8	2	CONN-POST TYPE .100-PIN-SPCG 24-CONT	28480	1252-0169
A7J7	1251-6073	3		CONNECTOR 2-PIN M POST TYPE	28480	1251-6073
A7J8	1252-0020	0	1	CONN-POST TYPE .100-PIN-SPCG 140-CONT	28480	1252-0020
A7J9	1251-7933	0	1	CONN-POST TYPE .100-PIN-SPCG 140-CONT	28480	1251-7933
A7JMP1	1258-0141	0	4	CONN-JUMPER 1 X 2	28480	1258-0141
A7JMP2	1258-0141	0	4	CONN-JUMPER 1 X 2	28480	1258-0141
A7JMP3	1258-0141	0	4	CONN-JUMPER 1 X 2	28480	1258-0141
A7JMP4	1258-0141	0	4	CONN-JUMPER 1 X 2	28480	1258-0141
A7JMP5	1258-0218	0	4	CONN-JUMPER 2 X 8	28480	1258-0218
A7JMP6	1258-0218	0	4	CONN-JUMPER 2 X 8	28480	1258-0218
A7L1	9140-0249	6	1	INDUCTOR 30UH .4DX.875LG Q=25	28480	9140-0249
A7MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A7MP2	1400-0249	0	2	CABLE TIE .062-.625-DIA .091-WD NYL	28480	1400-0249
A7P1	1252-0020	0	1	CONN-POST TYPE .100-PIN-SPCG 140-CONT	28480	1252-0020
A7R1	1810-0368	3	4	NETWORK-RES 6-SIP 10.0K OHM X 5	11236	750-61-R10K
A7R2	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+-100	24546	CT4-1/8-T0-237R-F
A7R3	1810-0318	3	2	NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A7R4	1810-0367	2	1	NETWORK-RES 6-SIP 4.7K OHM X 5	11236	750-61-R4.7K
A7R5	1810-0231	9	1	NETWORK-RES 8-SIP 2.2K OHM X 7	11236	750-81-R2.2K
A7R6	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1101-F
A7R7	1810-0368	3		NETWORK-RES 6-SIP 10.0K OHM X 5	11236	750-61-R10K
A7R8	1810-0203	5	1	NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81-R470
A7R9	1810-0280	8	9	NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R10	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R11	1810-0368	3		NETWORK-RES 6-SIP 10.0K OHM X 5	11236	750-61-R10K
A7R12	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R13	1810-0366	1	2	NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A7R14	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A7R15	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A7R16	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R17	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3162-F
A7R18	0757-0279	0	3	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3161-F
A7R19	1810-0206	8	2	NETWORK-RES 8-SIP 10.0K OHM X 7	11236	750-81-R10K
A7R20	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1962-F
A7R21	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3161-F
A7R22	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3161-F
A7R23	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R24	1810-0206	8		NETWORK-RES 8-SIP 10.0K OHM X 7	11236	750-81-R10K
A7R25	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R26	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R27	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A7R28	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R29	1810-0280	8		NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A7R30	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	CT4-1/8-T0-196R-F
A7R31	1810-0318	3		NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A7R32	1810-0368	3		NETWORK-RES 6-SIP 10.0K OHM X 5	11236	750-61-R10K
A7R33	0757-0489	4	1	RESISTOR 10 1% .25W F TC=0+-100	19701	5043R-1/4-T0-10R0-F
A7R34	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1961-F
A7R35	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A7R36-A7R99				NOT ASSIGNED		
A7R100	0698-3432	7	2	RESISTOR 26.1 1% .125W F TC=0+-100	03888	PME55-1/8-T0-26R1-F
A7R101	0698-3432	7		RESISTOR 26.1 1% .125W F TC=0+-100	03888	PME55-1/8-T0-26R1-F
A7S1	3101-2488	1	1	SWITCH-PB SPDT MOM .02A RED-BTN	28480	3101-2488
A7U1	1820-3100	8	4	IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A7U2	1820-3437	4	1	IC BFR TTL ALS NON-INV HEX	01295	SN74ALS1035N
A7U3	1820-2657	8	3	IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A7U4	1820-2889	8	1	IC GATE TTL ALS AND TPL 3-INP	01295	SN74ALS11N
A7U5	1820-1851	2	1	IC ENCDR TTL LS	34335	AM74LS148N

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A7U6	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A7U7	1820-2488	3	3	IC FF TTL ALS D-TYPE POS-EDGE TRIG	01295	SN74ALS74AN
A7U8	1820-3320	4	1	IC-16BIT,10MHZ,CERAMIC MPU W/32 BIT DATA	04713	MC68000L10
A7U9	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A7U10	1820-3707	1	3	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A7U11	05371-80015	9	1	PAL BUFFER CONTL	28480	05371-80015
A7U12	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A7U13	1820-3347	5	1	IC-10 MHZ PROGRAMMABLE INTERVAL TIMER	34649	P8254-2
A7U14	05371-80016	0	1	PAL ADDRESS DECC	28480	05371-80016
A7U15	1820-1433	6	1	IC SHF-RGTR TTL LS R-S SERIAL-IN PRL-OUT	01295	SN74LS164N
A7U16	1820-3885	6	1	IC DRVR TTL ALS LINE	01295	SN74ALS540N
A7U17	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A7U18	1820-4350	2	1	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS241AN
A7U19	1820-2284	7	1	IC MICPROC ACCESS NMOS 8-BIT	04713	MC68A50P
A7U20	1820-2634	1	1	IC INV TTL ALS HEX	01295	SN74ALS04BN
A7U21	1820-3481	8	5	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A7U22	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A7U23	1858-0054	4	1	TRANSISTOR ARRAY 16-PIN PLSTC DIP	28480	1858-0054
A7U24	1820-2656	7	1	IC GATE TTL ALS NAND QUAD 2-INP	01295	SN74ALS00AN
A7U25	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A7U26	1820-3707	1		IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A7U27	05371-89057	7	1	EPROM (SERIES 2812)	28480	05371-89057
A7U28	05371-89058	8	1	EPROM (SERIES 2812)	28480	05371-89058
A7U29	1820-3707	1		IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A7U30	05371-89059	9	1	EPROM (SERIES 2812)	28480	05371-89059
A7U31	05371-89060	0	1	EPROM (SERIES 2812)	28480	05371-89060
A7U32	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A7U33	1820-4391	1	2	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS646NT
A7U34	05371-89061	1	1	EPROM (SERIES 2812)	28480	05371-89061
A7U35	05371-89062	4	1	EPROM (SERIES 2812)	28480	05371-89062
A7U36	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A7U37	05371-89063	5	1	EPROM (SERIES 2812)	28480	05371-89063
A7U38	05371-89064	6	1	EPROM (SERIES 2812)	28480	05371-89064
A7U39	1820-4391	1		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS646NT
A7U40	05371-89065	7	1	EPROM (SERIES 2812)	28480	05371-89065
A7U41	05371-89066	8	1	EPROM (SERIES 2812)	28480	05371-89066
A7U42	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A7U43	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A7U44	1818-3981	8	4	IC CMOS 262144 (256K) STAT RAM 120-NS	S4013	HM62256LP-12
A7U45	1818-3981	8		IC CMOS 262144 (256K) STAT RAM 120-NS	S4013	HM62256LP-12
A7U46	1820-3834	5	1	IC TIMER CMOS	27014	MM58274N
A7U47	1820-4165	7	1	IC DCDR TTL ALS 2-TO-4-LINE DUAL	01295	SN74ALS139N
A7U48	1818-3981	8		IC CMOS 262144 (256K) STAT RAM 120-NS	S4013	HM62256LP-12
A7U49	1818-3981	8		IC CMOS 262144 (256K) STAT RAM 120-NS	S4013	HM62256LP-12
A7U50	1818-3760	1	2	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0562	TC5564PL-15
A7U51	1818-3760	1		IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0562	TC5564PL-15
A7U52	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A7U53	1820-3298	5	1	IC GATE CMOS/74HC OR QUAD 2-INP	27014	MM74HC32N
A7U54	1820-3081	4	1	IC FF CMOS/74HC D-TYPE POS-EDGE-TRIG	04713	MC74HC74N
A7W1	1251-6073	3		CONNECTOR 2-PIN M POST TYPE	28480	1251-6073
	1258-0141	8	4	JUMPER-REMOVABLE FOR 0.025 IN SQ PINS	28480	1258-0141
A7W2	1251-6073	3		CONNECTOR 2-PIN M POST TYPE	28480	1251-6073
	1258-0141	8		JUMPER-REMOVABLE FOR 0.025 IN SQ PINS	28480	1258-0141
A7W3	1251-4682	6	2	CONNECTOR 3-PIN M POST TYPE	28480	1251-4682
	1258-0141	8		JUMPER-REMOVABLE FOR 0.025 IN SQ PINS	28480	1258-0141
A7W4	1251-4682	6		CONNECTOR 3-PIN M POST TYPE	28480	1251-4682
	1258-0141	8		JUMPER-REMOVABLE FOR 0.025 IN SQ PINS	28480	1258-0141
A7W5	1252-0169	8	2	CONN-POST TYPE .100-PIN-SPCG 24-CONT	28480	1252-0169
	1258-0218	0	2	JUMPER 16 GOLD PLTD PHOSPHOR BRONZE	28480	1258-0218
A7W6	1252-0169	8		CONN-POST TYPE .100-PIN-SPCG 24-CONT	28480	1252-0169
	1258-0218	0		JUMPER 16 GOLD PLTD PHOSPHOR BRONZE	28480	1258-0218

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7XU27	1200-0567	1	10	SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU28	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200 0567
A7XU30	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU31	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU34	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU35	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU37	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU38	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU40	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7XU41	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A7Y1	1813-0143	8	1	CLOCK-OSCILLATOR-XTAL 19.6608-MHZ 0.05%	34344	RASCO-2-19.6608MHZ
A7Y2	0410-1617	8	1	XTAL OSC	28480	0410-1617

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8	05371-60008	8	1	I/O CONTROLLER BOARD ASSEMBLY (DATE CODE 88265)	28480	05371-60008
A8C1	0160-4557	0	26	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C2	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C4	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C5	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C6	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C7	0180-3813	1	1	CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A8C8	0160-4554	7	2	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A8C9	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A8C10	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C12	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C13	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C14	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C16	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C18	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C19	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C20	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C21	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C22	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C23	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C24	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C25	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C26	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C27	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C28	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8C29	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A8J1	1252-1034	8	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	28480	1252-1034
A8L1	9140-0249	6	1	INDUCTOR 30UH .4DX.875LG Q=25	28480	9140-0249
A8MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A8MP2	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A8MP3	1400-0249	0	1	CABLE TIE .062-.625-DIA .091-UD NYL	28480	1400-0249
A8P1	1252-0020	0	1	CONN-POST TYPE .100-PIN-SPCG 140-CONT	28480	1252-0020
A8Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A8R1	0757-0418	9	2	RESISTOR 619 1% .125W F TC=0+-100	24546	CT4-1/8-T0-619R-F
A8R2	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	CT4-1/8-T0-619R-F
A8R3	0757-0280	3	7	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R7	1810-0279	5	1	NETWORK-RES 10-SIP 4.7K OHM X 9	91637	CSC10A01-472G/MSP10A01-
A8R8	1810-0366	1	1	NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A8R9	1810-0367	2	4	NETWORK-RES 6-SIP 4.7K OHM X 5	11236	750-61-R4.7K
A8R10	1810-0367	2		NETWORK-RES 6-SIP 4.7K OHM X 5	11236	750-61-R4.7K
A8R11	0698-3444	1	8	RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R12	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R13	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R14	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R15	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R16	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R17	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R18	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	CT4-1/8-T0-316R-F
A8R19	0698-3408	7	1	RESISTOR 2.15K 1% .5W F TC=0+-100	28480	0698-3408
A8R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8R21	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R22	1810-0367	2		NETWORK-RES 6-SIP 4.7K OHM X 5	11236	750-61-R4.7K
A8R23	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1101-F
A8R24	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1961-F
A8R25	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1961-F
A8R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A8R27	1810-0367	2		NETWORK-RES 6-SIP 4.7K OHM X 5	11236	750-61-R4.7K
A8R28	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3481-F
A8U1	1820-2564	6	1	IC-MCU;CLK FREQ=.4MHZ, PERIPHERAL	34649	P8041AH MASKED
A8U2	1820-3391	9	1	IC MUXR/DATA-SEL TTL ALS 8-TO-1-LINE	01295	SN74ALS151N
A8U3	1820-1426	7	1	IC DCDR TTL LS BCD-TO-DEC 4-TO-10-LINE	01295	SN74LS145N
A8U4	1820-2779	5	1	IC CNTR TTL ALS BIN SYNCHRO	01295	SN74ALS163BN
A8U5	1820-2488	3	3	IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A8U6	1820-2882	1	1	IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	SN74ALS576N
A8U7	05371-80024	0	1	PAL CRT TIMING	28480	05371-80024
A8U8	1820-3466	9	3	IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	SN74ALS175N
A8U9	1820-3885	6	1	IC DRVR TTL ALS LINE	01295	SN74ALS540N
A8U10	1820-3466	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	SN74ALS175N
A8U11	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A8U12	1820-2546	4	1	IC-CRT CONTROLLER; FOR RASTER SCAN CRT'S	04713	MC6845P
A8U13	1820-2657	8	5	IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A8U14	1820-1922	8	2	IC SHF-RGTR TTL LS PRL-IN SERIAL-OUT	01295	SN74LS166AN
A8U15	1818-3538	1	4	DRAM 64KX4 150 NS PLSTC 5V	06383	MB81464-15P
A8U16	1820-3397	5	4	IC MUXR/DATA-SEL TTL ALS 4-TO-1-LINE	01295	SN74ALS153N
A8U17	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A8U18	1820-3481	8	3	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A8U19	1818-3538	1		DRAM 64KX4 150 NS PLSTC 5V	06383	MB81464-15P
A8U20	1820-3397	5		IC MUXR/DATA-SEL TTL ALS 4-TO-1-LINE	01295	SN74ALS153N
A8U21	1820-3466	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	SN74ALS175N
A8U22	1820-1922	8		IC SHF-RGTR TTL LS PRL-IN SERIAL-OUT	01295	SN74LS166AN
A8U23	1818-3538	1		DRAM 64KX4 150 NS PLSTC 5V	06383	MB81464-15P
A8U24	1820-3397	5		IC MUXR/DATA-SEL TTL ALS 4-TO-1-LINE	01295	SN74ALS153N
A8U25	1820-3394	2	1	IC GATE TTL ALS AND QUAD 2-INP	01295	SN74ALS09N
A8U26	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A8U27	1818-3538	1		DRAM 64KX4 150 NS PLSTC 5V	06383	MB81464-15P
A8U28	1820-3397	5		IC MUXR/DATA-SEL TTL ALS 4-TO-1-LINE	01295	SN74ALS153N
A8U29	1820-3437	4	1	IC BFR TTL ALS NON-INV HEX	01295	SN74ALS1035N
A8U30	1820-2732	0	1	IC-DMA CONTROLLER, 5MHZ	34649	P8237A-5
A8U31	1820-3145	1	1	IC DRVR TTL ALS BUS OCTL	01295	SN74ALS244AN
A8U32	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A8U33	1820-3318	0	1	IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	SN74ALS273N
A8U34	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A8U35	1820-2724	0	1	IC LCH TTL ALS TRANSPARENT OCTL	01295	SN74ALS573BN
A8U36	1820-3100	8	1	IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	SN74ALS138N
A8U37	1820-3707	1	1	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A8U38	1820-2635	2	1	IC GATE TTL ALS AND QUAD 2-INP	01295	SN74ALS08N
A8U39	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A8U40	1820-1568	8	2	IC BFR TTL LS BUS QUAD	01295	SN74LS125AN
A8U41	1820-3376	0	1	IC INV TTL ALS HEX	01295	SN74ALS05AN
A8U42	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A8U43	1820-2757	9	1	IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	SN74ALS574AN
A8U44	1820-1568	8		IC BFR TTL LS BUS QUAD	01295	SN74LS125AN
A8U45	1820-2774	0	1	IC GATE TTL ALS NAND DUAL 4-INP	01295	SN74ALS20AN
A8U46	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A8U47	1820-3431	8	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	DS75160AN
A8U48	1820-3513	7	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	DS75161AN
A8U49	1820-2488	3		IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	SN74ALS74AN
A8U50	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER	28480	1820-2548

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	05371-60009	9	1	DOUBLE REGULATOR BOARD ASSEMBLY (DATE CODE 88265)	28480	05371-60009
A9C1	0160-4557	0	10	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C2	0160-4904	1	1	CAPACITOR-FXD 6800PF +-5% 50VDC CER	28480	0160-4904
A9C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C4	0180-1735	2	1	CAPACITOR-FXD .22UF+-10% 35VDC TA	56289	150D224X9035A2
A9C5	0180-0374	3	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A9C6	0160-4822	2	2	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A9C7	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A9C8	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C9	0180-3611	7	2	CAPACITOR-FXD 290UF+-20% 63VDC AL	28480	0180-3611
A9C10	0180-3611	7		CAPACITOR-FXD 290UF+-20% 63VDC AL	28480	0180-3611
A9C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C12	0180-3939	2	1	CAPACITOR-FXD 430UF+-20% 63VDC TA	56289	677D437M063GL1A
A9C13	0180-3196	3	3	CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A9C14	0180-2755	8	1	CAPACITOR-FXD 900UF+75-10% 25VDC AL	00853	300GJ901U025B
A9C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C16	0180-3196	3		CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A9C17	0180-3196	3		CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A9C18	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A9C19	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C20	0160-4554	7	1	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A9C21	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C22	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C23	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C24	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A9C25	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A9CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR3	1901-0953	5	1	DIODE-PWR RECT 50V 30A 50NS	9N171	UES601R
A9CR4	1901-1065	2	1	DIODE-PWR RECT 1N4936 400V 1A 200NS	14936	1N4936
A9CR5	1901-0673	6	2	DIODE-PWR RECT 100V 5A 5US	03508	A15A
A9CR6	1901-0673	6		DIODE-PWR RECT 100V 5A 5US	03508	A15A
A9CR7	1902-0939	9	1	VOLTAGE SUPPRESSOR VR=5.0V,VC=8V	11961	1N5908
A9CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9F1	2110-0713	9	1	FUSE-SUBMINIATURE 10A 125V NTD .28X.955	28480	2110-0713
A9H1	0535-0031	2	6	NUT-HEX W/LKWR M3 X 0.5 2.4MM-THK	00000	ORDER BY DESCRIPTION
A9H2	1205-0472	7	1	HEAT SINK- 6254	28480	1205-0472
A9H3	51053-20202	2	1	HEATSINK	28480	51053-20202
A9H4	0570-0647	0	4	STD-PRS-IN M2 X 0.5 15.000 PH-BRZ	46384	KFH-M3-15-ET
A9L1	9140-0551	3	1	INDUCTOR RF-CH-MLD 10UH 5% .105DX.26LG	28480	9140-0551
A9L2	9140-0654	7	2	INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0654
A9L3	9140-1294	3	1	INDUCTOR-35UH	28480	9140-1294
A9L4	9140-0508	0	1	INDUCTOR 35UH 10% 1.45D	28480	9140-0508
A9L5	9140-0654	7		INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0654
A9MP1	0403-0620	6	2	EXTR-PC BD NAT NYL .07-IN-BD-THKNS	13103	5021
A9MP2	0340-0503	0	1	INSULATOR-XSTR POLYE	28480	0340-0503
A9MP3	0340-0583	6	2	INSULATOR-XSTR THRM-CNDCT	28480	0340-0583
A9MP4	0340-0754	3	1	INSULATOR-XSTR POLYE GREEN	28480	0340-0754
A9MP5	1200-0185	9	1	INSULATOR-XSTR NYLON	28480	1200-0185
A9P1	1251-7986	9	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7986
A9Q1	1854-0922	7	1	TRANSISTOR NPN 2N6274 PD=250W FT=30MHZ	28480	1854-0922
A9Q2	1854-0090	0	1	TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	25403	2N3053LV 2449
A9Q3	1854-0215	1	3	TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904
A9Q4	1853-0497	9	1	TRANSISTOR PNP TO-220AB PD=50W	03508	D45H11
A9Q5	1853-0340	1	1	TRANSISTOR PNP 2N5884 SI TO-3 PD=200W	04713	2N5884
A9Q6	1854-0635	9	1	TRANSISTOR NPN SI PD=50W FT=20MHZ	03508	D44H5
A9Q7	1853-0016	8	1	TRANSISTOR PNP SI TO-92 PD=300MW	28480	1853-0016
A9Q8	1854-0215	1		TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904
A9Q9	1854-0215	1		TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A9R1	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	CT4-1/8-T0-511R-F
A9R2	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3831-F
A9R3	0698-3155	1	3	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4641-F
A9R4	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A9R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A9R6	0757-0276	7	3	RESISTOR 61.9 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6192-F
A9R7	0757-0442	9	8	RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R8	0757-0276	3		RESISTOR 61.9 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6192-F
A9R9	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R10	0757-0280	3	13	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A9R11	0757-0442	4		RESISTOR 10K 1% .125W F TC=0+-100	28480	0757-0442
A9R12	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6192-F
A9R13	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R14	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A9R15	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R16	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R17	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6192-F
A9R18	0757-0273	4	1	RESISTOR 3.01K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3011-F
A9R19	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4641-F
A9R20	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4641-F
A9R21	0698-3432	7	1	RESISTOR 26.1 1% .125W F TC=0+-100	03888	PME55-1/8-T0-26R1-F
A9R22	0812-0021	8	1	RESISTOR .47 5% 3W PW TC=0+-90	91637	CW2B1-3-T2-47/100-J
A9R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R24	2100-3273	1	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A9R25	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A9R26	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A9R27	0757-0316	6	1	RESISTOR 42.2 1% .125W F TC=0+-100	28480	0757-0316
A9R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A9R29	0757-0444	1	2	RESISTOR 12.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1212-F
A9R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A9R31				NOT ASSIGNED		
A9R32	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1212-F
A9R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R34	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A9R35	0757-0439	4	2	RESISTOR 6.81K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6811-F
A9R36	0837-0175	5	1	POSISTOR 100 OHMS AT 25 DEG C	51406	PTH487A01BC471TS
A9R37	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+-100	24546	CT4-1/8-T0-383R-F
A9R38	0757-0459	8	1	RESISTOR 56.2K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5622-F
A9R39	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6811-F
A9R40-A9R199				NOT ASSIGNED		
A9R200	0757-0276	7	1	RESISTOR 61.9 1% .125W F TC=0+-100	24546	CT4-1/8-T0-6192-F
A9R201	0811-3601	4	1	RESISTOR .0065 TC=0+-20	28480	0811-3601
A9U1	1826-0428	9	1	IC 3524 MODULATOR 16-DIP-C	01295	SG3524J
A9U2	1826-0412	1	1	IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N
A9U3	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A9U4	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A10	51089-60015	1	1	TRIPLE REGULATOR BOARD ASSEMBLY (DATE CODE 88265)	28480	51089-60015
A10C1	0160-5875	7	9	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C2	0180-0374	3	2	CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A10C3	0180-3194	1	2	CAPACITOR-FXD 270UF+50-10% 25VDC AL	28480	0180-3194
A10C4	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A10C5	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C6	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C7	0180-2755	8	1	CAPACITOR-FXD 900UF+75-10% 25VDC AL	00853	300GJ901U025B
A10C8	0160-4835	7	1	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C9				NOT ASSIGNED		
A10C10	0180-3077	9	2	CAPACITOR-FXD 680UF+100-10% 50VDC AL	28480	0180-3077
A10C11	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A10C12	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C13	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A10C14	0160-0576	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A10C15	0160-4822	2	1	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A10C16	0180-3194	1		CAPACITOR-FXD 270UF+50-10% 25VDC AL	28480	0180-3194
A10C17	0180-3195	2	1	CAPACITOR-FXD 390UF+50-10% 20VDC AL	28480	0180-3195
A10C18	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A10C19	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C20	0180-3077	9		CAPACITOR-FXD 680UF+100-10% 50VDC AL	28480	0180-3077
A10C21	0180-1735	2	1	CAPACITOR-FXD .22UF+-10% 35VDC TA	56289	150D224X9035A2
A10C22	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C23	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C24	0180-3196	3	3	CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A10C25	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 50VDC CER	28480	0160-0127
A10C26	0160-4904	1	1	CAPACITOR-FXD 6800PF +-5% 50VDC CER	28480	0160-4904
A10C27	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10C28	0180-3196	3		CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A10C29	0180-3196	3		CAPACITOR-FXD 120UF+50-10% 40VDC AL	28480	0180-3196
A10C30	0160-5875	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-5875
A10CR1	1901-0025	2	6	DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR2	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR3	1901-0953	5	1	DIODE-PWR RECT 50V 30A 50NS	9N171	UES601R
A10CR4	1901-1065	2	1	DIODE-PWR RECT 1N4936 400V 1A 200NS	14936	1N4936
A10CR5	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR6	1901-0518	8	4	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A10CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A10CR8	1902-0047	0	1	DIODE-ZNR 17.8V 2% DO-35 PD=.4W	28480	1902-0047
A10CR9	1902-3110	4	1	DIODE-ZNR 5.9V 2% DO-35 PD=.4W TC=+.017%	28480	1902-3110
A10CR10	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR11	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A10CR12	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A10CR13	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR14	1884-0297	2	1	THYRISTOR-SCR 2N6504 TO-220AB VRRM=50	04713	2N6504
A10CR15	1902-0958	2	1	DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.075%	28480	1902-0958
A10CR16	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	1N645
A10CR17	1901-1080	1	2	DIODE-SCHOTTKY 20V 1A	04713	1N5817(RELAXED)
A10CR18	1901-1080	1		DIODE-SCHOTTKY 20V 1A	04713	1N5817(RELAXED)
A10H1	0535-0031	2	8	NUT-HEX W/LKWR M3 X 0.5 2.4MM-THK	00000	ORDER BY DESCRIPTION
A10H2	1205-0460	3	1	HEAT SINK MULT SPCL-HOLE-PATT	28480	1205-0460
A10H3	0570-0647	0	8	STD-PRS-IN M2 X 0.5 15.000 PH-BRZ	46384	KFH-M3-15-ET
A10L1	9100-0539	3	1	INDUCTOR (MISC ITEM)	28480	9100-0539
A10L2	9140-0508	0	1	INDUCTOR 35UH 10% 1.45D	28480	9140-0508
A10L3	9140-0653	6	1	INDUCTOR-FIXED INDUCTANCE: 83 UH +-10%	28480	9140-0653
A10L4	9140-0509	1	1	INDUCTOR 227UH 10% 1.45D	28480	9140-0509
A10L5	9140-0482	9	4	INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0482
A10L6	9140-0482	9		INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0482
A10L7	9140-0654	7	1	INDUCTOR-FIXED INDUCTANCE 7.4 UH +-12%	28480	9140-0654
A10L8	9140-0482	9		INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0482
A10L9	9140-0482	9		INDUCTOR-FIXED INDUCTANCE: 7.4 UH +-12%	28480	9140-0482

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A10MP1	0340-0503	0	1	INSULATOR-XSTR POLYE	28480	0340-0503
A10MP2	0340-0583	6	2	INSULATOR-XSTR THRM-CNDCT	28480	0340-0583
A10MP3	0340-0754	3	1	INSULATOR-XSTR POLYE GREEN	28480	0340-0754
A10MP4	0340-0962	5	2	INSULATOR-XSTR POLYE	28480	0340-0962
A10MP5	1200-0185	9	1	INSULATOR-XSTR NYLON	28480	1200-0185
A10Q1	1854-0922	7	1	TRANSISTOR NPN 2N6274 PD=250W FT=30MHZ	28480	1854-0922
A10Q2	1853-0363	8	1	TRANSISTOR PNP SI PD=50W FT=20MHZ	03508	X45H281
A10Q3	1854-0215	1	1	TRANSISTOR NPN SI TO-92 PD=350MW	04713	2N3904
A10Q4	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	3L585	2N3053S
A10R1	0683-3025	3	2	RESISTOR 3K 5% .25W CF TC=0-400	01121	CB3025
A10R2	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	01121	CB3025
A10R3	2100-0554	5	1	RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	28480	2100-0554
A10R4	2100-3212	8	1	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	28480	2100-3212
A10R5	0683-2705	4	1	RESISTOR 27 5% .25W CF TC=0-400	01121	CB2705
A10R6	0683-2045	5	4	RESISTOR 200K 5% .25W CF TC=0-800	01121	CB2045
A10R7	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A10R8	0698-4471	6	1	RESISTOR 7.15K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-7151-F
A10R9	0699-0633	6	1	RESISTOR 2.475K .1% .125W F TC=0+-25	28480	0699-0633
A10R10	0683-6205	7	2	RESISTOR 62 5% .25W CF TC=0-400	01121	CB6205
A10R11	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1003-F
A10R12	0757-0442	9	5	RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A10R13	0757-0430	5	1	RESISTOR 2.21K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2211-F
A10R14	0683-1035	1	4	RESISTOR 10K 5% .25W CF TC=0-400	01121	CB1035
A10R15	0698-3558	8	1	RESISTOR 4.02K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4021-F
A10R16	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A10R17	0698-3497	4	1	RESISTOR 6.04K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-604R-F
A10R18	0683-4745	6	1	RESISTOR 470K 5% .25W CF TC=0-800	01121	CB4745
A10R19	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	01121	CB1035
A10R20	0757-0289	2	1	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	5033R-1/8-T0-1332-F
A10R21	0757-0455	4	1	RESISTOR 36.5K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3652-F
A10R22	0683-6235	3	1	RESISTOR 62K 5% .25W CF TC=0-400	01121	CB6235
A10R23	0761-0058	2	1	RESISTOR 750 5% 1W MO TC=0+-200	28480	0761-0058
A10R24	0683-2045	5		RESISTOR 200K 5% .25W CF TC=0-800	01121	CB2045
A10R25	0757-0414	5	1	RESISTOR 432 1% .125W F TC=0+-100	24546	CT4-1/8-T0-432R-F
A10R26	0698-8574	8	1	RESISTOR 2.429K .1% .125W F TC=0+-25	28480	0698-8574
A10R27	0811-3544	4	1	RESISTOR .1 5% 3.25W PW TC=0+-90	28480	0811-3544
A10R28	0686-7515	0	1	RESISTOR 750 5% .5W CC TC=0+529	01121	EB7515
A10R29	0811-0548	2	1	RESISTOR .47 5% .5W PW TC=0+-300	75042	BW20-5/10-.47R-J
A10R30	0683-6205	7		RESISTOR 62 5% .25W CF TC=0-400	01121	CB6205
A10R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A10R32	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A10R33	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A10R34	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A10R35	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A10R36	0698-3557	7	1	RESISTOR 806 1% .125W F TC=0+-100	24546	CT4-1/8-T0-806R-F
A10R37	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	01121	CB1035
A10R38	0811-1077	4	1	RESISTOR .033 5% 2W PWW TC=0+-90	28480	0811-1077
A10R39	0683-2735	0	1	RESISTOR 27K 5% .25W CF TC=0-400	01121	CB2735
A10R40	0698-6855	4	1	RESISTOR 8.16K .5% .125W F TC=0+-50	24546	NC4-1/8-T2-8161-D
A10R41	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	01121	CB1025
A10R42	0698-6869	0	1	RESISTOR 8.66K .5% .125W F TC=0+-50	28480	0698-6869
A10R43	0683-5105	4	1	RESISTOR 51 5% .25W CF TC=0-400	01121	CB5105
A10R44	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	01121	CB1005
A10R45	0811-3601	4	1	RESISTOR .0065 TC=0+-20	28480	0811-3601
A10R46	0698-6630	3	1	RESISTOR 20K .1% .125W F TC=0+-25	28480	0698-6630
A10R47	0683-2045	5		RESISTOR 200K 5% .25W CF TC=0-800	01121	CB2045
A10R48	0698-6322	0	1	RESISTOR 4K .1% .125W F TC=0+-25	28480	0698-6322
A10R49	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-7501-F
A10R50	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A10R51	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3831-F
A10R52	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-5111-F
A10R53	0683-2045	5		RESISTOR 200K 5% .25W CF TC=0-800	01121	CB2045
A10R54	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	01121	CB1035
A10R55	0683-6815	5	1	RESISTOR 680 5% .25W CF TC=0-400	01121	CB6815

See introduction to this section for ordering information
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Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10U1	1813-0114	3	2	IC V RGLTR TO-3	12969	PIC645
A10U2	1813-0114	3		IC V RGLTR TO-3	12969	PIC645
A10U3	1826-0428	9	2	IC 3524 MODULATOR 16-DIP-C	01295	SG3524J
A10U4	1826-0848	7	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	28480	1826-0848
A10U5	1826-0637	2	1	IC V RGLTR-SWG 40V 16-DIP-C PKG	34333	SG3524 SELECTED
A10U6	1826-0428	9		IC 3524 MODULATOR 16-DIP-C	01295	SG3524J

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11	05371-60011	3	1	FRONT PANEL BOARD (DATE CODE 88265)	28480	05371-60011
A11DS1	1990-0485	5	9	LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS2	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS3	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS4	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS5	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS6	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS7	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS8	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS9	1990-0485	5		LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V	28480	HLMP-1503
A11DS10	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A11H1	2950-0001	8	1	NUT-HEX-DBL-CHAM 3/8-32-THD .094 IN-THK	00000	ORDER BY DESCRIPTION
A11J1	1252-1024	6	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	28480	1252-1024
A11RPG1	0960-0684	2	1	ROTARY PULSE GENERATOR INPUT POWER: 5VDC	28480	0960-0684
				A11 MISCELLANEOUS PARTS AND HARDWARE		
	8150-0454	6	1	WIRE 24AWG VIO 300V PVC 7X32 80C	28480	8150-0447
	8150-0449	8	1	WIRE 24AWG R 300V PVC 7X32 80C	28480	8150-0449
	8150-0452	3	1	WIRE 24AWG G 300V PVC 7X32 80C	28480	8150-0452

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A12	05371-60012	4	1	MOTHERBOARD ASSEMBLY (DATE CODE 88265)	28480	05371-60012
A12C1	0160-4557	0	12	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C2	0160-5286	4	4	CAPACITOR-FXD .47UF +-20% 100VDC CER	28480	0160-5286
A12C3	0160-5286	4		CAPACITOR-FXD .47UF +-20% 100VDC CER	28480	0160-5286
A12C4	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C5	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C6	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C7	0160-4554	7	3	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A12C8	0180-3813	1	2	CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A12C9	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C10	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A12C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C12	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C13	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A12C14	0180-3813	1		CAPACITOR-FXD 10UF+-20% 10VDC TA	56289	299D106X9010BB1
A12C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C16	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C18	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C19	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A12C20	0180-3771	0	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	28480	0180-3771
A12C21-A12C99				NOT ASSIGNED		
A12C100	0160-5286	4		CAPACITOR-FXD .47UF +-20% 100VDC CER	28480	0160-5286
A12C101	0160-5286	4		CAPACITOR-FXD .47UF +-20% 100VDC CER	28480	0160-5286
A12CR1	1902-0939	9	1	VOLTAGE SUPPRESSOR VR=5.0V,VC=8V	11961	1N5908
A12CR2	1901-0050	3	12	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR10	1901-0518	8	1	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A12CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR13	1902-0952	6	2	DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A12CR14	1902-0952	6		DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A12CR15	1902-0945	7	1	DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A12CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A12CR18	1902-0960	6		DIODE-ZNR 12V 5% DO-35 PD=.4W TC=+.077%	11707	1N963B
A12J1	1252-2057	7	1	CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-67-1103
A12J2	1252-0033	5	1	CONN-UTIL P-&-SKT 4-CKT 4-CONT	28480	1252-0033
A12J3	1251-8339	8	1	CONN-UTIL P-&-SKT 3-CKT 3-CONT	28480	1251-8339
A12J4	1252-0056	2	1	CONN-POST TYPE .156-PIN-SPCG 4-CONT	28480	1252-0056
A12J5	1252-1283	9	1	CONN-POST TYPE .100-PIN-SPCG 24-CONT	28480	1252-1283
A12J6	1252-1284	0	1	CONN-POST TYPE .100-PIN-SPCG 40-CONT	28480	1252-1284
A12J7	1251-6080	2	2	CONNECTOR 6-PIN M METRIC POST TYPE	28480	1251-6080
A12J8	1251-6080	2		CONNECTOR 6-PIN M METRIC POST TYPE	28480	1251-6080
A12J9	1200-0483	0	1	SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0483
A12J10	1252-1516	1	1	CONN-POST TYPE .100-PIN-SPCG 14-CONT	00779	103169-5
A12Q1	1884-0250	7	1	THYRISTOR-TRIAC TO-220AB	3L585	T2500B
A12R1	1810-0280	8	1	NETWORK-RES 10-SIP 10.0K OHM X 9	91637	CSC10A01-103G/MSP10A01-
A12R2	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A12R3	0757-0442	9	7	RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R4	0698-3348	4	1	RESISTOR 4.64K 1% .5W F TC=0+-100	28480	0698-3348
A12R5	0698-3260	9	2	RESISTOR 464K 1% .125W F TC=0+-100	28480	0698-3260
A12R6	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R7	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1472-F
A12R8	0698-3158	4	1	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2372-F
A12R9	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R10	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-4221-F

See introduction to this section for ordering information
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Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A12R11	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	5033R-1/8-T0-6191-F
A12R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R13	NOT ASSIGNED					
A12R14	0757-0394	0	4	RESISTOR 51.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-51R1-F
A12R15	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-51R1-F
A12R16	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-51R1-F
A12R17	1810-0318	3	1	NETWORK-RES 6-SIP 1.0K OHM X 5	32997	4606X-101-102/4306R-101
A12R18	0698-3441	8	2	RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A12R19	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	CT4-1/8-T0-215R-F
A12R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A12R21	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	CT4-1/8-T0-51R1-F
A12R22	1810-0277	3	1	NETWORK-RES 10-SIP 2.2K OHM X 9	91637	CSC10A01-222G/MSP10A01-
A12R23	0757-0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3161-F
A12R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R25	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1001-F
A12R26	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3161-F
A12R27	0698-3260	9		RESISTOR 464K 1% .125W F TC=0+-100	28480	0698-3260
A12R28	0698-3452	1	1	RESISTOR 147K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1473-F
A12R29	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1002-F
A12R30	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-3831-F
A12R31	0698-4421	6	1	RESISTOR 249 1% .125W F TC=0+-100	24546	CT4-1/8-T0-249R-F
A12S1	3101-2747	5	1	SWITCH-SL 8-1A DIP-SLIDE-ASSY .1A 30VDC	28480	3101-2747
A12U1	1820-3707	1	1	IC DRVR TTL ALS LINE OCTL	01295	SN74ALS541N
A12U2	1826-0117	3	1	IC 7812 V RGLTR TO-3	07263	7812KC
A12U3	1826-0122	0	1	IC 7805 V RGLTR TO-220	07263	7805UC
A12U4	1820-2657	8	1	IC GATE TTL ALS OR QUAD 2-INP	01295	SN74ALS32N
A12U5	1820-3560	4	1	IC DRVR TTL ALS NAND LINE HEX 2-INP	01295	SN74ALS804N
A12U6	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A12U7	1820-3270	3	2	IC GATE TTL ALS NAND QUAD 2-INP	01295	SN74ALS03AN
A12U8	1826-0147	9	1	IC 7812 V RGLTR TO-220	04713	MC7812CP
A12U9	1990-0845	1	1	OPTO-ISOLATOR IF=50MA-MAX VAX=250V	28480	1990-0845
A12U10	1820-3270	3		IC GATE TTL ALS NAND QUAD 2-INP	01295	SN74ALS03AN
A12U11	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A12XA1A	1251-7865	3	4	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7865
A12XA1B	1252-1547	8	5	CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534126-1
A12XA1F	1250-2057	3	13	CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA1G	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA1H	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA2A	1251-7865	3		CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7865
A12XA2B	1252-1547	8		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534126-1
A12XA4A	1251-7865	3		CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7865
A12XA4B	1252-1547	8		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534126-1
A12XA4C	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA4D	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA4E	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA4F	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5A	1252-1547	8		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534126-1
A12XA5E	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5G	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5H	1252-1547	8		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534126-1
A12XA5I	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5J	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5K	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA5L	1250-2057	3		CONNECTOR-RF SM-SLD FEM PC	00779	221158-1
A12XA6	1252-1815	3	3	CONN-POST TYPE .100-PIN-SPCG 140-CONT	18873	68513-070
A12XA7	1252-1815	3		CONN-POST TYPE .100-PIN-SPCG 140-CONT	18873	68513-070
A12XA8	1252-1815	3		CONN-POST TYPE .100-PIN-SPCG 140-CONT	18873	68513-070
A12XA9	1251-7865	3		CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-7865
A12XA10A	1251-2034	8	1	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	28480	1251-2034
A12XA10B	1251-2035	9	2	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A12XA15	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A12XU2	1252-1861	9	1	CONNECTOR-SGL CONT SKT .041-IN-BSC-SZ	00779	50865-8
	1400-1439	2	3	CLAMP-FL-CA .375-WD NYL	02768	8511-46-00-9909

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A13	05371-60013	5	1	REAR PANEL BOARD (DATE CODE 88265)	28480	05371-60013
A13J1	1252-1516	1	1	CONN-POST TYPE .100-PIN-SPCG 14-CONT	00779	103169-5
A13J2	1250-1806	8	6	CONNECTOR-RF BNC FEMALE P.C.	28480	1250-1806
A13J3	1250-1806	8		CONNECTOR-RF BNC FEMALE P.C.	28480	1250-1806
A13J4	1250-1806	8		CONNECTOR-RF BNC FEMALE P.C	28480	1250-1806
A13J5	1250-1806	8		CONNECTOR-RF BNC FEMALE P.C.	28480	1250-1806
A13J6	1250-1806	8		CONNECTOR-RF BNC FEMALE P.C.	28480	1250-1806
A13J7	1250-1806	8		CONNECTOR-RF BNC FEMALE P.C.	28480	1250-1806

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A14	05371-60014	6	1	TIMEBASE MULTIPLIER BOARD ASSEMBLY (DATE CODE 8826S)	28480	05371-60014
A14C1	0160-3879	7	3	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A14C2	0160-4040	6	5	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A14C3	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A14C4	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A14C5	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A14C6	0160-4389	6	6	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C7	0160-0576	5	7	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C8	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A14C9	0160-4497	7	11	CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C10	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C12	0160-4350	1	2	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
A14C13	0160-4350	1		CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
A14C14	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C15	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C16	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C17	0160-4521	8	2	CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A14C18	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C19	0160-4382	9	1	CAPACITOR-FXD 3.3PF +-.25PF 200VDC CER	28480	0160-4382
A14C20	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C21	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C22	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A14C23	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C24	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A14C26	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C27	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C29	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C30	0160-4040	6		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A14C31	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C32	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C33	0160-4497	7		CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A14C34	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A14C35	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C36	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C100	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A14C101				ETCHED ON PC BOARD		
A14C102	--			ETCHED ON PC BOARD		
A14CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14CR2	1901-1068	5	2	DIODE-SCHOTTKY SM SIG	28480	1901-1068
A14CR3	1901-1068	5		DIODE-SCHOTTKY SM SIG	28480	1901-1068
A14CR4	0122-0161	4	1	DIODE-VVC 2.15PF 7% BVR=30V	25403	BB405B
A14CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14J1	1251-2913	2	4	CONNECTOR-SGL CONT SKT .041-IN-BSC-SZ	28480	1251-2913
A14J2	1251-2913	2		CONNECTOR-SGL CONT SKT .041-IN-BSC-SZ	28480	1251-2913
A14J3	1251-2913	2		CONNECTOR-SGL CONT SKT .041-IN-BSC-SZ	28480	1251-2913
A14J4	1251-2913	2		CONNECTOR-SGL CONT SKT .041-IN-BSC-SZ	28480	1251-2913
A14J5	1250-1367	6	2	CONNECTOR-RF SM-SLD FEM PC 50-OHM	28480	1250-1367
A14J6				NOT ASSIGNED		
A14J7	1250-1367	6		CONNECTOR-RF SM-SLD FEM PC 50-OHM	28480	1250-1367
A14J8	1250-1408	6	3	CONNECTOR-RF SMC FEM PC 50-OHM	28480	1250-1408
A14J9	1250-1408	6		CONNECTOR-RF SMC FEM PC 50-OHM	28480	1250-1408
A14J10	1250-1408	6		CONNECTOR-RF SMC FEM PC 50-OHM	28480	1250-1408
A14L1	9140-0519	3	7	INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L2	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L3	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L4	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L5	9135-0080	2	1	INDUCTOR 27NH 5.556% 2.6D-MMX6.6LG-MM	28480	9135-0080

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14L6	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L7	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14L8	9140-0532	0	2	INDUCTOR RF-CH-MLD 1.2UH 5% .105DX.26LG	28480	9140-0532
A14L9	9140-0532	0		INDUCTOR RF-CH-MLD 1.2UH 5% .105DX.26LG	28480	9140-0532
A14L10	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A14MP1	0340-0834	0	2	INSULATOR-XSTR POLYI	28480	0340-0834
A14MP2	0340-1174	3	2	INSULATOR-XSTR THRM-CNDCT	55285	3223-07FR-13
A14Q1	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A14Q2	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A14R1	0698-7220	7	4	RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A14R2	0698-7228	7	3	RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A14R3	0698-7220	7		RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A14R4	0698-7228	7		RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A14R5	1810-0364	9	3	NETWORK-RES 6-SIP 470.0 OHM X 5	11236	750-61-R470
A14R6	0699-1542	8	3	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R7	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A14R8	1810-0364	9		NETWORK-RES 6-SIP 470.0 OHM X 5	11236	750-61-R470
A14R9	0698-7208	3	1	RESISTOR 68.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-68R1-F
A14R10	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-TO-215R-F
A14R11	1810-0364	9		NETWORK-RES 6-SIP 470.0 OHM X 5	11236	750-61-R470
A14R12	0698-7252	7	4	RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-TO-4641-F
A14R13	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-TO-4641-F
A14R14	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-TO-4641-F
A14R15	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-TO-4641-F
A14R16	0698-7228	7		RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A14R17	0698-7227	6	1	RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-TO-422R-F
A14R18	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-TO-215R-F
A14R19	0698-7226	5	1	RESISTOR 383 1% .05W F TC=0+-100	24546	C3-1/8-TO-383R-F
A14R20	0699-2263	2	1	RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A14R21	0698-7243	6	1	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1961-F
A14R22				NOT ASSIGNED		
A14R23	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A14R24	0698-7224	3	1	RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-TO-316R-F
A14R25	0698-7273	2	2	RESISTOR 34.8K 1% .05W F TC=0+-100	24546	C3-1/8-TO-3482-F
A14R26	0699-1991	1	2	RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A14R27	0698-7212	9	2	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A14R28	0699-1991	1		RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A14R29	0698-7222	1	1	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-TO-261R-F
A14R30	0698-7211	8	1	RESISTOR 90.9 1% .05W F TC=0+-100	24546	C3-1/8-TO-90R9-F
A14R31	0698-7273	2		RESISTOR 34.8K 1% .05W F TC=0+-100	24546	C3-1/8-TO-3482-F
A14R32	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A14R33	0698-7236	7	2	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1001-F
A14R34	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1001-F
A14R100	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A14U1	1820-1383	5	2	IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A14U2	1820-3485	2	2	IC PRESCR ECL	04713	MC12090L
A14U3	1820-3935	7	1	IC PRESCR ECL	04713	MC12009L
A14U4	1820-1383	5		IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A14U5	1820-3485	2		IC PRESCR ECL	04713	MC12090L
A14U6	1820-1344	8	1	IC PL LOOP 14-DIP-C PKG	04713	MC12040L
A14U7	1826-0372	2	1	IC MISC 8-DIP-P PKG	28480	A251-0100
A14U8	1813-0215	5	1	IC WIDEBAND AMPL TO-39 PKG	04713	MWA220
A14U9	1826-0519	9	1	IC OP AMP LOW-BIAS-H-IMPD 8-DIP-P PKG	01295	TL071CP
A14U10	1813-0216	6	1	IC WIDEBAND AMPL TO-39 PKG	04713	MWA230

See introduction to this section for ordering information
*Indicates factory selected value

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A16	51083-60108	7	1	POWER MODULE CABLE ASSEMBLY	28480	51083-60108
A17	2090-0209	4	1	CRT AND CRT DRIVEP BOARD	28480	2090-0209

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-2. 5371A Board Assemblies Replaceable Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				MISCELLANEOUS HARDWARE AND CHASSIS PARTS		
A1	05371-60001	1	1	TIMEBASE CONTROL BOARD ASSY	28480	05371-60001
A2	05371-60002	2	1	INPUT AMPLIFIER BOARD ASSY	28480	05371-60002
A3				NOT ASSIGNED		
A4	05371-60004	4	1	INTERPOLATOR BOARD ASSY	28480	05371-60004
A5	05371-60027	9	1	ZDT/COUNT BOARD ASSY	28480	05371-60027
A6	05371-60018	0	1	DMA/GATE BOARD ASSY	28480	05371-60018
A7	05371-60007	7	1	PROCESSOR BOARD	28480	05371-60007
A8	05371-60008	8	1	I/O CONTROLLER BOARD	28480	05371-60008
A9	05371-60009	9	1	DOUBLE REGULATOR BOARD ASSY	28480	05371-60009
A10	51089-60015	1	1	TRIPLE REGULATOR BOARD ASSY	28480	51089-60015
A11	05371-60011	3	1	FRONT PANEL BOARD ASSY	28480	05371-60011
A12	05371-60012	4	1	MOTHER BOARD ASSY	28480	05371-60012
A13	05371-60013	5	1	REAR PANEL BOARD ASSY	28480	05371-60013
A14	05371-60014	6	1	TIMEBASE MULTIPLIER BOARD ASSY	28480	05371-60014
A15	10811-60111	8	1	OVEN OSCILLATOR ASSY	28480	10811-60111
A16	51083-60108	7	1	POWER MODULE CABLE ASSY	28480	51083-60108
A17	2090-0209	4	1	CRT AND CRT DRIVER BOARD ASSY	28480	2090-0209
B1	3160-0361	9	1	FAN-TBAX 105-CFM 115V 50/60-HZ 2KV-DIEL	28480	3160-0361
C1	0180-3572	9	1	CAPACITOR-FXD .037F+75-10% 50VDC AL	28480	0180-3572
C2	0160-3036	8	4	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
C3	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
C4	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
C5	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
CR1	1906-0231	2	1	DIODE-CT-RECT 200V 15A	1B546	R712
F1	2110-0002	9	1	FUSE 2A 250V NTD 1.25X.25 UL	75915	312002
F1	2110-0055	2	1	FUSE 4A 250V NTD 1.25X.25 UL	75915	312004
H1	0380-1523	0	2	STANDOFF-HEX 10.1-MM-LG M3.5 X 0.6-THD	28480	0380-1523
H2				NOT ASSIGNED		
H3	0515-0411	0	8	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-0411
H4	0515-0885	2	25	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
H5	0515-0897	3	61	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0897
H6	0515-0896	5	14	SCREW-MACH M4 X 0.7 10MM-LG	28480	0515-0896
H7	0515-1110	8	2	SCREW-MACH M3 X 0.5 12MM-LG PAN-HD	28480	0515-1110
H8	0515-1132	4	4	SCREW-MACH M5 X 0.8 10MM-LG	28480	0515-1132
H9	0515-1232	5	12	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
H10	0515-1323	5	20	SCREW-MACH M3 X 0.5 30MM-LG PAN-HD	28480	0515-1323
H11	0515-1331	5	8	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 6	28480	0515-1331
H12	0515-1367	7	8	SCREW-MACH M4 X 0.7 8MM-LG 90-DEG-FLH-HD	28480	0515-1367
H13	0515-1430	5	17	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
H14	0515-1516	8	4	SCREW-MACH M4 X 0.7 85MM-LG PAN-HD	28480	0515-1516
H15	0515-1824	1	4	SCREW-TPG M4 X 0.7 12MM-LG PAN-HD	28480	0515-1824
H16	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.4MM-THK	00000	ORDER BY DESCRIPTION
H17	0535-0110	8	29	NUT-SPECIALTY LKG 2.41MM-THK 9.53MM-WD	71785	BR125000PG
H18	0624-0217	5	4	SCREW-TPG 8-32 .5-IN-LG PAN-HD-POZI STL	28480	0624-0217
H19	2190-0011	8	2	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0011
H20	2190-0102	8	7	WASHER-LK INTL T 15/32 IN .472-IN-ID	28480	2190-0102
H21	2190-0577	1	2	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0577
H22	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
H23	2360-0201	9	2	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
H24	2680-0129	8	2	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
H25	2950-0035	8	7	NUT-HEX-DBL-CHAM 15/32-32-THD	00000	ORDER BY DESCRIPTION
H26	3050-0589	0	12	WASHER-FL NM NO. 5 .136-IN-ID .375-IN-OD	28480	3050-0589
H27	5081-7683	6	1	NUT-BNC	28480	5081-7683
H28	6960-0002	4	3	PLUG-HOLE DOME-HD FOR .5-D-HOLE STL	28480	6960-0002
H29	05371-20205	3	1	PLUG-HOLE X ARM	28480	05371-20205
H30	54100-25701	0	2	NUT-POD LOCK	28480	54100-25701

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-3. 5371A Miscellaneous Hardware and Chassis Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
H31	0515-1105	1	8	SCREW-MACH M3 X 0.5 10MM-LG PAN-HD	28480	0515-1105
H32	2190-0034	5	2	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
H33	0515-1245	0	2	SCREW-SPCL M3.5 X 0.6 12MM-LG	00000	ORDER BY DESCRIPTION
H34	0510-1253	0	2	RETAINER-RING E-RING-EXT 3.580-MM-DIA	79136	5133-14-ZI
H35	3050-0001	1	4	WASHER-ML MTLC NO. 8 .172-IN-ID	28480	3050-0001
H36	0624-0481	5	2	SCREW-TPG 2-28 .219-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
H37	0624-0481	5	2	SCREW-TPG 2-28 .219-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP1	05371-00009	3	1	SHIELD-RF CAVITY	28480	05371-00009
MP2	05371-00010	6	1	CAGE CARD-AY	28480	05371-00010
MP3	05371-00011	7	1	BRACKET-PROBE	28480	05371-00011
MP4	05371-00013	9	1	SHIELD-TRANSFORMER	28480	05371-00013
MP5	05371-00014	0	1	COVER-RF CAVITY	28480	05371-00014
MP6	05371-00015	1	1	PANEL-REAR	28480	05371-00015
MP7	05371-00016	2	1	COVER-POWER SUPPLY	28480	05371-00016
MP8	05371-40001	9	1	PANEL-FRONT	28480	05371-40001
MP9	05371-40002	0	1	KEYPAD	28480	05371-40002
MP10	05371-80004	6	1	WINDOW-5371	28480	05371-80004
MP11	05371-80021	7	1	CRT DUST SHIELD	28480	05371-80021
MP12	1400-0611	0	1	CLAMP-FL-CA 1-WD	28480	1400-0611
MP13	1460-1345	5	2	TILT STAND SST	28480	1460-1345
MP14	3160-0092	3	1	FINGER GUARD	28480	3160-0092
MP15	5020-8897	8	2	TRIM-FRT HDL	28480	5020-8897
MP16	5021-5805	4	1	FRAME-FRONT	28480	5021-5805
MP17	5021-5806	5	1	FRAME-REAR	28480	5021-5806
MP18	5021-5838	3	4	CORNET STRUT	28480	5021-5838
MP19	5040-7201	8	4	FOOT	28480	5040-7201
MP20	5040-7202	9	1	TOP TRIM	28480	5040-7202
MP21	5040-7221	2	4	STANDOFF-REAR	28480	5040-7221
MP22	5041-6819	4	2	STRP-HDLE CAP FR	28480	5041-6819
MP23	5041-6820	7	2	STRP-HDLE CAP R	28480	5041-6820
MP24	5060-9805	4	2	STRAP HANDLE AY	28480	5060-9805
MP25	5061-9436	9	1	TOP COVER	28480	5061-9436
MP26	5061-9500	8	2	HANDLE-FRONT	28480	5061-9500
MP27	01650-47401	7	1	KNOB	28480	01650-47401
MP28	05371-00017	3	1	COVER-BOTTOM	28480	05371-00017
MP29	05371-00018	4	2	COVER-SIDE	28480	05371-00018
MP30	05371-00021	9	1	BRKT-CRT PRINTED CIRCUIT BOARD	28480	05371-00021
MP31	05371-20204	2	1	RF CAVITY	28480	05371-20204
MP32	54100-45201	7	2	PROBE GUIDE	28480	54100-45201
MP33	54100-64101	6	2	COVER-POD	28480	54100-64101
MP34	05371-80025	1	1	INSULATOR	28480	05371-80025
MP35	0340-0596	1	1	INSULATOR-XSTR THRM-CNDCT	28480	0340-0596
MP36	0340-0685	9	1	INSULATOR MYLAR CLEAR	28480	0340-0685
MP37	05371-00022	0	2	INSULATOR, SAFETY SHIELD	28480	05371-00022
MP38	05371-00023	0	2	SHIELD-CABLE	28480	05371-00023
S1	3101-2906	8	1	SWITCH-RKR SUBMIN SPDT 3A 250VAC	78553	B123J1ZQ1E
T1	9100-4672	3	1	TRANSFORMER-POWER 100/120/220/240V	28480	9100-4672
W1				NOT ASSIGNED		
W2				NOT ASSIGNED		
W3	8120-4965	8	1	50-OHM RIBBON CABLE ASSY	00779	222236-1
W4	05371-60201	3	1	POWER SUPPLY CABLE ASSY	28480	05371-60201
W5	05371-60202	4	1	FRONT PANEL CABLE ASSY	28480	05371-60202
W6	05371-60204	6	1	DMA CABLE ASSY	28480	05371-60204
W7	05371-60205	7	1	HP-IB CABLE ASSY	28480	05371-60205
W8	05371-60206	8	1	FAN CABLE ASSY	28480	05371-60206
W9	05371-60207	9	1	EXTERNAL ARM CHANNEL CABLE ASSY	28480	05371-60207
W10	05371-60208	0	2	REAR PANEL INPUT (OPTION 060)	28480	05371-60208
W11	05371-60208	0		REAR PANEL INPUT (OPTION 060)	28480	05371-60208
W12	05371-60215	9	1	REAR PANEL EXTERNAL ARM CABLE ASSY	28480	05371-60215
W13	05371-60216	0	2	CLOCK CABLE ASSY	28480	05371-60216
W14	05371-60216	0		CLOCK CABLE ASSY	28480	05371-60216
W15	05371-60217	1	1	CLOCK CABLE ASSY	28480	05371-60217

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-3. 5371A Miscellaneous Hardware and Chassis Parts (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
W16	05371-60220	6	2	500 MHZ CLOCK CABLE ASSY	28480	05371-60220
W17	05371-60220	6		500 MHZ CLOCK CABLE ASSY	28480	05371-60220
W18	05371-60221	7	1	TIMEBASE POWER CABLE ASSY	28480	05371-60221
W19	05371-60222	8	2	POD CABLE ASSY	28480	05371-60222
W20	05371-60222	8		POD CABLE ASSY	28480	05371-60222
W21	05371-60223	9	1	EXTERNAL ARM CHANNEL EXTENSION CABLE ASY	28480	05371-60223
W22	8120-1378	1	1	POWER CORD CABLE ASSY	28480	8120-1378
W23	54100-67602	8	2	CUSTOM CONN ASSY	28480	54100-67602
W24	54100-67602	8		CUSTOM CONN ASSY	28480	54100-67602
	05371-80001	3	1	LABEL KIT, FRONT PANEL	28480	05371-80001
	54002A	3	2	50 OHM POD	28480	54002A
	5955-8032	4	1	X-RAY LABEL	28480	5955-8032

See introduction to this section for ordering information
***Indicates factory selected value**

Table 4-4. Manufacturer's Code List

Mfr Code	Manufacturer Name	Address	Zip Code
S0562	TOSHIBA CORP	TOKYO JP	
S4013	HITACHI AMERICA LTD	SUNNYVALE CA US	94086
00000	ANY SATISFACTORY SUPPLIER		
00779	AMP INC	HARRISBURG PA US	17111
00853	SANGAMO CAPACITOR DIV	PICKENS SC US	29671
01121	ALLEN-BRADLEY CO INC	EL PASO TX US	79935
01295	TEXAS INSTRUMENTS INC	DALLAS TX US	75265
02768	ITW FASTEX	DES PLAINES IL US	60016
03508	GE CO SEMICONDUCTOR PROD DEPT	AUBURN NY US	13201
03888	K D I PYROFILM CORP	WHIPPANY NJ	07981
04713	MOTOROLA INC SEMI-COND PROD	PHOENIX AZ US	85008
06383	PANDUIT CORP	TINLEY PARK IL US	60477
06665	PRECISION MONOLITHICS INC.	SANTA CLARA CA	95050
07263	FAIRCHILD CORP	MOUNTAIN VIEW CA US	94042
1B546	VARO SEMICONDUCTOR INC	GARLAND TX US	75046
11236	CTS CORP BERNE DIV	BERNE IN US	46711
11707	IDEAL PRECISION METER CO INC	BROOKLYN NY	11222
11961	SEMICON INC	BURLINGTON MA	01803
12969	UNITRODE CORP	WATERTOWN MA	02172
13103	THERMALLOY INC	DALLAS TX US	75234
13606	SPRAGUE ELECTRIC SEMICON DIV	CONCORD NH	03301
14433	ITT SEMICONDUCTORS DIV	TUSTIN CA US	92680
14936	GENERAL INSTRUMENT CORP (DIODE)	HICKSVILLE NY US	11802
15542	MINI-CIRCUITS LAB DIV SCTFC CMPNT	BROOKLYN NY	11229
16299	CORNING ELECTRONICS	RALEIGH NC US	27604
18324	SIGNETICS CORP	SUNNYVALE CA US	94086
18873	DUPONT E I DE NEMOURS & CO	WILMINGTON DE US	19801
19701	MEPCO/CENTRALAB INC	WEST PALM BEACH FL US	33407
24226	GOWANDA ELECTRONICS CORP	GOWANDA NY US	14070
24355	ANALOG DEVICES INC	NORWOOD MA US	02062
24546	CORNING ELECTRONICS	SANTA CLARA CA US	95050
25403	NV PHILIPS ELCOMA DEPT	EINDHOVEN HL	02876
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA CA US	95052
27167	CORNING GLASS WORKS (WILMINGTON)	WILMINGTON NC	28401
27264	MOLEX PRODUCTS CO	LISLE IL US	60532
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO CA	94304
3L585	RCA CORP SOLID STATE DIV	SOMERVILLE NJ	
32997	BOURNS INC	RIVERSIDE CA US	92507
34333	SILICON GENERAL INC	WESTMINSTER CA	92683
34335	ADVANCED MICRO DEVICES INC	SUNNYVALE CA US	94086
34344	MOTOROLA INC	FRANKLIN PARK IL US	60131
34649	INTEL CORP	SANTA CLARA CA US	95054
46384	PENN ENGINEERING & MFG CORP	DANBORO PA US	18916
5N615	OMRON CORPORATION OF AMERICA	SCHAUMBURG IL	60172
51406	MURATA CORPORATION OF AMERICA	MARIETTA GA US	30067
51642	CENTRE ENGINEERING INC	STATE COLLEGE PA	16801
51959	VICLAN INC	SAN DIEGO CA	92138
55285	BERGQUIST CO	MINNEAPOLIS MN	55420
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS MA	01247
71785	TRW CONNECTORS	ELK GROVE VILLA IL US	60007
73138	BECKMAN INDUSTRIAL CORP	FULLERTON CA US	92632
75042	TRW INC PHILADELPHIA DIV	PHILADELPHIA PA	19108
75915	LITTELFUSE INC	DES PLAINES IL US	60016
78553	TINNERMAN PRODUCTS INC	CLEVELAND OH	44101
79136	WALDES-KOHINOOR INC	LG ISLAND CITY NY	11101
9N171	UNITRODE CORP	LEXINGTON MA US	02173
91637	DALE ELECTRONICS INC	EL PASO TX US	79936
92912	BEL FUSE INC	JERSEY CITY NJ US	07302

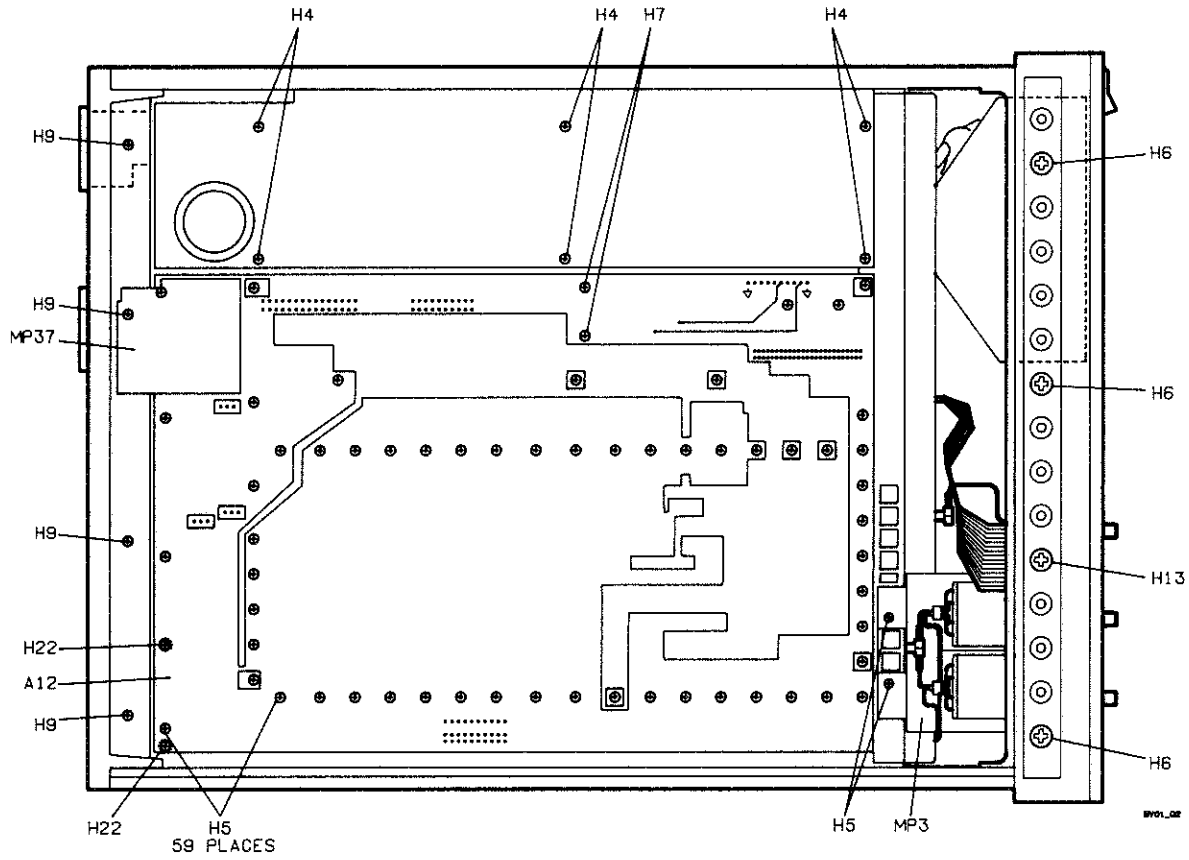


Figure 4-1. Hardware - 5371A Botttom View

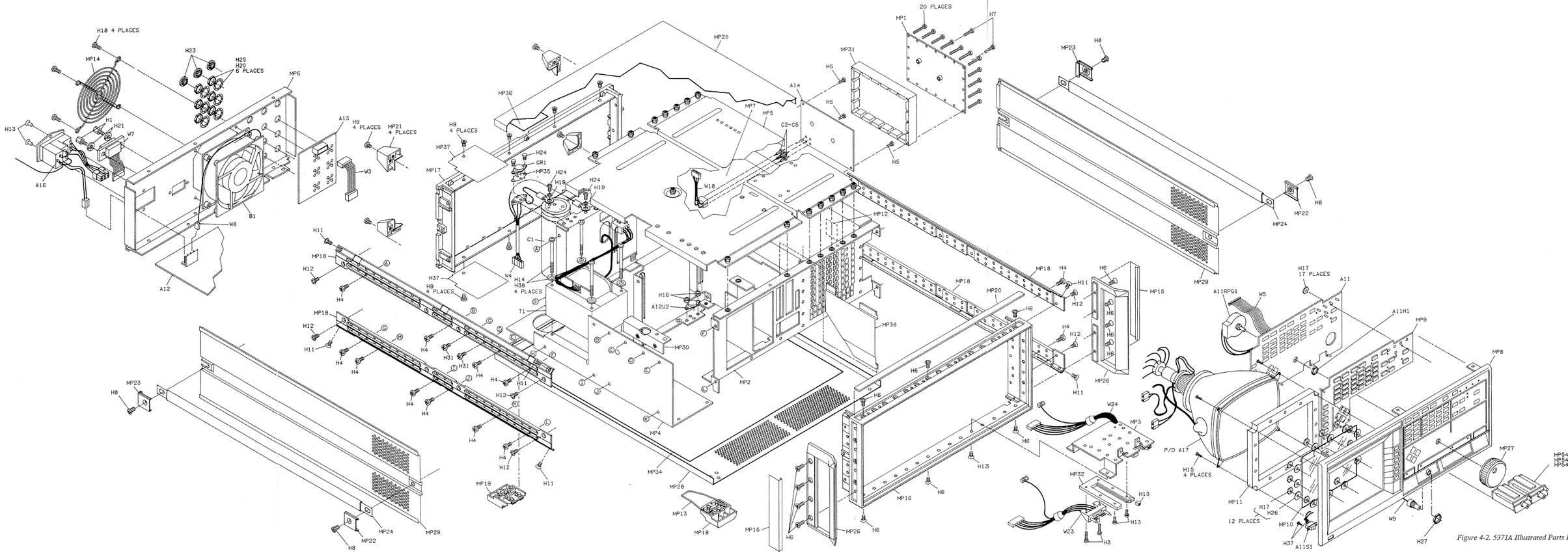


Figure 4-2. 5371A Illustrated Parts Breakdown (IPB)

Figure 4-2.
5371A ILLUSTRATED PARTS BREAKDOWN (IPB)

(See Page 4-51)

5 MANUAL CHANGES

SECTION 5
MANUAL CHANGES

5-1. INTRODUCTION

This section contains information necessary for adapting this manual to older instruments (serial prefixes lower than the one listed on the title page). Information is included regarding the use of MANUAL UPDATING CHANGES sheets for updating manuals to newer instruments.

5-2. MANUAL CHANGES

This manual applies directly to HP 5371A Frequency and Time Analyzer's with serial numbers prefixed as indicated on the title page (i.e., 2842A). Manual changes with lower or higher serial prefixes are described in the following paragraphs.

5-3. Newer Instruments

As engineering changes are made, newer instruments may have serial prefix numbers higher than the ones listed on the title page of this manual (i.e., higher than 2842A). The manuals for these instruments will be provided with MANUAL UPDATING CHANGES sheets that contain the required updating information. Replace the affected pages or modify existing manual information as directed in the MANUAL UPDATING CHANGES pages. Contact the nearest Hewlett-Packard Sales and Support Office (listed at the back of this manual) if the change information is missing.

5-4. Older Instruments

To adapt this manual to older instruments having a serial number prefix lower than 2842A, perform the backdating that applies to your instrument's serial prefix as listed in *Table 6-1*.

Table 6-1. HP 5371A Instrument Backdating

If your instrument has serial number prefix or serial number	Make the following changes to your manual
2828	1
2824	1,2
2812	1,2,3
2808	1 thru 4
2804	1 thru 5
2744	1 thru 6

CHANGE 1

Instruments with serial prefix 2828 and below had a different A5 board with HP Part Number 05371-60025. To backdate this manual to be applicable to instruments with serial prefix 2828 and below, make the following changes:

a. Replace the schematic diagram and component locator in Section 7E with the schematic and component locator for the 05371-60025 board shown in *Figure 5-1.*

b. Replace the parts list in Section 4 with the parts list for the 05371-60025 shown in *Table 5-1.*

CHANGE 2

Instruments with serial prefix 2824 and below had a different set of EPROMS on the A7 board. If the part numbers on your A7 board differ from those in the parts list in Section 4 and require replacement, order Service Kit HP Part Number 05371-67002.

Also changes were made to the A6 Board, to backdate this manual for these changes, make the following changes:

a. In the parts list in Section 4, change A6Q3 to "1854-0686 Transistor, A400". Add "R201 Resistor – Zero Ohms 8159-0005". Delete "Jumper 1X2 HP Part Number 1258-0141".

CHANGE 3

Instruments with serial prefix 2812 and below had a different set of EPROMS on the A7 board. If the part numbers on your A7 board differ from those in the parts list in Section 4 and require replacement, order Service Kit HP Part Number 05371-67002.

CHANGE 4

Instruments with serial prefix 2808 and below had different resistor values on the A9 Board. To backdate this manual for these changes, make the following changes to your manual.

Change the parts list in Section 4 for the A9 Board as follows:

a. Change A9R8 to "0757-0280 RESISTOR 1K 1% .125W, 24546, CT4-1/8-TO-1001F".

b. Change A9R10 and A9R11 to "0698-8827 RESISTOR 1M 1% .125W, 28480, 0698-8827".

c. Change A9R200 to "0698-0082 RESISTOR 464 1% .125W, 24546, CT4-1/8-TO-4640-F".

CHANGE 5

Instruments with serial prefix 2804 and below had the following changes:

a. Some instruments had an older model fan B1 with HP Part Number 3160-0361. The preferred parts replacement is HP Part Number 3160-0553.

b. Also a resistor was used in place of diode CR18 on the A12 board.

c. Resistor R23 on the A6 board had a different value and power rating.

d. A6Q3 did not have a ferrite bead.

To backdate this manual, make the following changes:

a. On the schematic and parts list for A12, change CR18 to "R13 0757-0442 RF" 10 K 1% .125W, 24546, CT4-1/8-TO-1002-F.

b. On the schematic and parts list, change A6R23 to "0698-7229 RF: 511 1% 0.05W, 24546 C3-1/8-TO-511R-F". The preferred parts replacement is the one given in the current parts list of this manual. Also delete the ferrite bead on A6Q3.

CHANGE 6

Instruments with serial prefix 2744 and below had the following changes:

a. Used a different set of EPROMS on the A7 Processor Board.

b. Did not have RFI cable shield (05371-00023).

c. On the A6 board, A6U35 had a different part number, and A6R300 and A6R301 were not installed. Also, A6U37 and A6U38 had a different part number.

To backdate the manual, make the following changes:

a. No changes are necessary for the EPROM change on A7, for replacement EPROMS, order Service Kit HP Part Number 0571-67002.

b. In the parts list, delete Cable HP Part Number 05371-00023.

c. In the Parts List for A6, change A6U35 to "1820-1211". Also delete A6R300 and A6R301. In addition, change A6U37 and A6U38 to "1818-4111", noting however that the current part number is the preferred parts replacement.

Table 5-1. Parts List for 05371-60025 A5 ZDT/Count Board

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5	05371-60025	9	1	ZDT/COUNT BOARD ASSY (SERIES 2744)	28480	05371-60025
A5C1	0160-0576	5	87	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C2	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C3	0160-4389	6	3	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C4	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C5	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A5C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C9				NOT ASSIGNED		
A5C10	0160-4554	7	6	CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C11	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A5C12	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C13	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C15	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C16	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C17	0180-3775	4	3	CAPACITOR-FXD 68UF+-20% 10VDC TA	28480	0180-3775
A5C18	0180-3775	4		CAPACITOR-FXD 68UF+-20% 10VDC TA	28480	0180-3775
A5C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C20	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C21	0180-3775	4		CAPACITOR-FXD 68UF+-20% 10VDC TA	28480	0180-3775
A5C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C23	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C24	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C25	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C29	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C30	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C31	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C32	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C33	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C34	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C35	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C36	0160-4554	7		CAPACITOR-FXD .01UF +-20% 50VDC CER	28480	0160-4554
A5C37	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C38	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C41	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C42	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C43	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C44	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C45	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C46	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C47	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C48	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C49	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C50	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C51	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C52	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C53	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C54	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C55	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C56	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C57	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C58	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C59	0160-4521	8	1	CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	28480	0160-4521
A5C60	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576

See introduction to this section for ordering information
*Indicates factory selected value

Table 5-1. Parts List for 05371-60025 A5 ZDT/Count Board (Continued)

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5C61	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C62	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C63	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C64	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C65	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C66	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C67	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C68	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C69	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C70	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C71	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C72	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C73	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C74	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C75	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C76	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C77	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C78	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C79	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C80	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C81	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C82	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C83	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C84	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C85	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C86	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C87	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C88	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C89	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C90	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C91	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C92	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C93	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C94	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C95	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C96	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C97	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C98	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C99	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C100	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C101-A5C299				NOT ASSIGNED		
A5C300	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C301	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C302-A5C399				NOT ASSIGNED		
A5C400	0160-3879	7	2	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5C401	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5H1	3050-0098	6	4	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098

See introduction to this section for ordering information
*Indicates factory selected value

Table 5-1. Parts List for 05371-60025 A5 ZDT/Count Board (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5J1				NOT ASSIGNED		
A5J2	1252-1035	9	1	CONN-POST TYPE .100-PIN-SPCG 50 CONT	28480	1252-1035
A5J3	1250-0835	1	3	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A5J4	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A5J5	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0835
A5L1	9140-1170	4	3	INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5L2	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5L3	9140-1170	4		INDUCTOR 1.2UH 20% .198D-INX.448LG-IN	24226	18M121M-1
A5MP1	0403-0620	6	2	EXTP-PC BD NAT NYL .07-IN-BD-THKNS	18103	5021
A5P1-A5P3				NOT ASSIGNED		
A5P4	1252-1546	7	2	CONN-POST TYPE .100 PIN-SPCG 64-CONT	00779	534127-1
A5P5	1250-2052	8	6	CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P6				NOT ASSIGNED		
A5P7	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P8	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P9	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P10	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5P11	1252-1546	7		CONN-POST TYPE .100-PIN-SPCG 64-CONT	00779	534127-1
A5P12	1250-2052	8		CONNECTOR-RF SM-SNP M PC	00779	221162-1
A5R1	0698-7205	0	4	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A5R2	1810-0366	1	12	NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R3	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R4	1810-0270	6	6	NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R5	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R6	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R7	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R8	1810-1070	6	4	NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R9	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R10	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R11	0699-2253	0	8	RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R12	0699-2252	9	8	RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R13	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R14	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R15	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R16	0698-7220	9	2	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-TO-215R-F
A5R17	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-2151-F
A5R18	1810-0275	1	6	NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R19	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-TO-2151-F
A5R20				NOT ASSIGNED		
A5R21				NOT ASSIGNED		
A5R22	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R23	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R24				NOT ASSIGNED		
A5R25	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R26	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R27	0698-8819	4	1	RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A5R28	1810-1070	6		NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R29	0698-3439	4	2	RESISTOR 178 1% .125W F TC=0+-100	24546	CT4-1/8-T0-178R-F
A5R30	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R31	0699-1542	8	7	RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R32	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R33	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R34	0757-0395	1	2	RESISTOR 56.2 1% .125W F TC=0+-100	24546	CT4-1/8-T0-56R2-F
A5R35	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R36	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R37	0757-0395	1		RESISTOR 56.2 1% .125W F TC=0+-100	24546	CT4-1/8-T0-56R2-F
A5R38	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R39	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R40	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252

See introduction to this section for ordering information
*Indicates factory selected value

Table 5-1. Parts List for 05371-60025 A5 ZDT/Count Board (Continued)

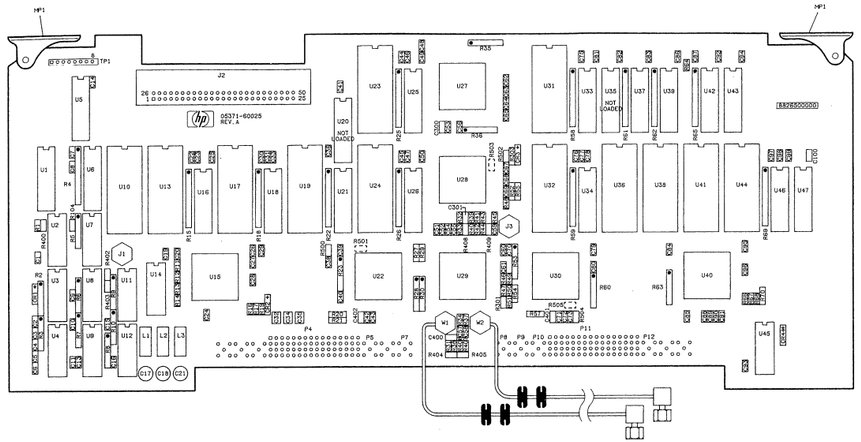
Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5R41	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R42	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R43	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R44	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R45	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R46	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R47	0699-2252	9		RESISTOR 82 1% .125W TF TC0=+-50	28480	0699-2252
A5R48	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R49	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R50	0699-2253	0		RESISTOR 120 1% .125W TF TC=0+-50	28480	0699-2253
A5R51	0699-2254	1	1	RESISTOR 470 1% .125W TF TC=0+-50	28480	0699-2254
A5R52	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	CT4-1/8-T0-101-F
A5R53	1810-1070	6		NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R54	0698-8820	7	1	RESISTOR 4.64 1% .125W F TC=0+-100	28480	0698-8820
A5R55	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0+-100	24546	CT4-1/8-T0-111-F
A5R56				NOT ASSIGNED		
A5R57	0698-3439	4		RESISTOR 178 1% .125W F TC=0+-100	24546	CT4-1/8-T0-178R-F
A5R58	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R59	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R60	1810-0366	1		NETWORK-RES 6-SIP 220.0 OHM X 5	11236	750-61-R220
A5R61	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R62	1810-0275	1		NETWORK-RES 10-SIP 1.0K OHM X 9	91637	CSC10A01-102G/MSP10A01-
A5R63	1810-1070	6		NETWORK-RC RES 5 X 50 OHMS +-5%; TC	91637	CSRC-06-C30-500J-103M
A5R64	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R65	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R66	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R67	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5R68	0698-7220	9		RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A5R69	1810-0270	6		NETWORK-RES 10-SIP 680.0 OHM X 9	91637	CSC10A01-681G/MSP10A01-
A5R70	0698-3438	3	2	RESISTOR 147 1% .125W F TC=0+-100	24546	CT4-1/8-T0-147R-F
A5R71-A5R300				NOT ASSIGNED		
A5R301	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R302				NOT ASSIGNED		
A5R303	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	CT4-1/8-T0-147R-F
A5R304-A5R399				NOT ASSIGNED		
A5R400	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R401	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A5R402	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R403	0699-1542	8		RESISTOR 51 1% .125W F TC=0+-50	28480	0699-1542
A5R404	0699-2363	3	1	RESISTOR 39 1% .125W TF TC0=+-50	28480	
A5R405	0699-1991	1	1	RESISTOR 33 1% .125W TF TC=0+-50	28480	0699-1991
A5R406	0699-2364	4	2	RESISTOR 390 1% .125W TF TC0=+-50	28480	0699-2364
A5R407	0699-2364	4		RESISTOR 390 1% .125W TF TC0=+-50	28480	0699-2364
A5R408	0699-2263	2	2	RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A5R409	0699-2263	2		RESISTOR 100 1% .125W TF TC=0+-50	28480	0699-2263
A5R410-A5R499				NOT ASSIGNED		
A5R500	0698-3428	1	3	RESISTOR 14.7 1% .125W F TC=0+-100	03888	PME55-1/8-T0-14R7-F
A5R501	0757-0346	2	3	RESISTOR 10 1% .125W F TC=0+-100	28480	0757-0346
A5R502	0698-3428	1		RESISTOR 14.7 1% .125W F TC=0+-100	03888	PME55-1/8-T0-14R7-F
A5R503	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	28480	0757-0346
A5R504	0698-3428	1		RESISTOR 14.7 1% .125W F TC=0+-100	03888	PME55-1/8-T0-14R7-F
A5R505	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	28480	0757-0346
A5U1	1820-4318	2	2	IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N
A5U2	1820-3522	8	3	IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U3	1820-3521	7	1	IC XLTR ECL/10KH TTL-TO-ECL QUAD	04713	MC10H124L
A5U4	1820-3076	7	2	IC FF ECL/10KH D-M/S COM CLOCK DUAL	04713	MC10H131L
A5U5	1820-4318	2		IC FF TTL AS D-TYPE POS-EDGE-TRIG CLEAR	01295	SN74AS574N

See introduction to this section for ordering information
*Indicates factory selected value

Table 5-1. Parts List for 05371-60025 A5 ZDT/Count Board (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5U6	1820-3481	8	15	IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U7	1820-3076	7		IC FF ECL/10KH D-M/S COM CLOCK DUAL	04713	MC10H131L
A5U8	1820-3337	3	2	IC GATE ECL/10KH AND QUAD 2-INP	04713	MC10H104P
A5U9	1820-2962	8	1	IC GATE ECL/10KH OR QUAD 2-INP	04713	MC10H103P
A5U10	1818-4111	8	12	IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U11	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U12	1820-3102	0	1	IC CNTR ECL/10KH BIN SYNCHRO 4-BIT	04713	MC10H016L
A5U13	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U14	1820-3337	3		IC GATE ECL/10KH AND QUAD 2-INP	04713	MC10H104P
A5U15	1DK5-0001	6	6	IC:ZERO DEAD TIM	28480	1DK5-0001
A5U16	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U17	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U18	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U19	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U20				NOT ASSIGNED		
A5U21	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U22	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U23	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U24	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U25	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U26	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U27	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U28	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U29	1DK6-0001	8	1	IC:SEQUENCER	28480	1DK6-0001
A5U30	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U31	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U32	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U33	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U34	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U35				NOT ASSIGNED		
A5U36	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U37	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U38	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U39	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U40	1DK5-0001	6		IC:ZERO DEAD TIM	28480	1DK5-0001
A5U41	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U42	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U43	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U44	1818-4111	8		IC CMOS 65536 (64K) STAT RAM 55-NS 3-S	04713	MCM6164C55
A5U45	1820-3522	8		IC XLTR ECL/10KH ECL-TO-TTL QUAD	04713	MC10H125L
A5U46	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5U47	1820-3481	8		IC TRANSCEIVER TTL ALS BUS OCTL	01295	SN74ALS645AN
A5W1	05371-60218	2	2	CBL ASSY COUNT	28480	05371-60218
A5W2	05371-60218	2		CBL ASSY COUNT	28480	05371-60218
A5XU15	1200-1372	8	7	SKT-PGAT2PINPCMT	28480	1200-1372
A5XU22	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU27	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU28	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU29	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU30	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372
A5XU40	1200-1372	8		SKT-PGAT2PINPCMT	28480	1200-1372

See introduction to this section for ordering information
***Indicates factory selected value**



A5 SCHEMATIC DIAGRAM NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD A5 ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN FARADS; INDUCTANCE IN HENRIES.
3. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT. AVERAGE VALUE SHOWN.
4. A TILDE ("~") PRECEDING A SIGNAL INDICATES A NEGATIVE-TRUE SIGNAL.
5. THE 05371-60025 BOARDS (SERICS NUMBER 2707, REV. A) ARE MODIFIED AS FOLLOWS:
   A. COAXIAL CABLE, W3, CONNECTS A5U8A(2) TO A5U9(C1). THE COAXIAL CABLE'S OUTER GROUND CONDUCTOR CONNECTS TO THE GROUND SIDE OF A5C18 AT ONE END AND TO A5U28(D1) AT THE OTHER.
   B. JUMPER WIRE W4 CONNECTS A5U7(2) TO A5U7(9).
   C. JUMPER WIRE W5 CONNECTS A5U7(7) TO A5R8A.
   D. JUMPER WIRE W6 CONNECTS A5U5(6) TO A5R8D.
   E. JUMPER WIRE W7 CONNECTS A5U12(7,9, 10) TO CATHODE OF DIODE A5CR1.
   F. THE FOLLOWING 14.7Ω RESISTORS HAVE BEEN ADDED TO THE COMPONENT SIDE OF PC BOARD: A5R500, R504 AND R502.
   G. THE FOLLOWING 10Ω RESISTORS HAVE BEEN ADDED TO THE CIRCUIT SIDE OF PC BOARD: A5R501, R505 AND R503.
6. IC'S A5U28 AND U35 ARE NOT LOADED IN PC BOARD, AVAILABLE FOR FUTURE EXPANSION.
7. THIS IS THE SERIAL NUMBER OF THE PC BOARD. ENGINEERING CHANGES ARE KEYED TO THE 5-DIGIT PREFIX OF THE SERIAL NUMBER. TO TRACK ENGINEERING CHANGES THAT MAY HAVE OCCURED SINCE MANUAL'S LAST PRINTING, REFER TO YELLOW "MANUAL UPDATING CHANGES" SHEETS. FOR MORE DETAILS, SEE "IDENTIFICATION MARKINGS ON PRINTED-CIRCUIT BOARDS" PARAGRAPH IN SECTION 7.

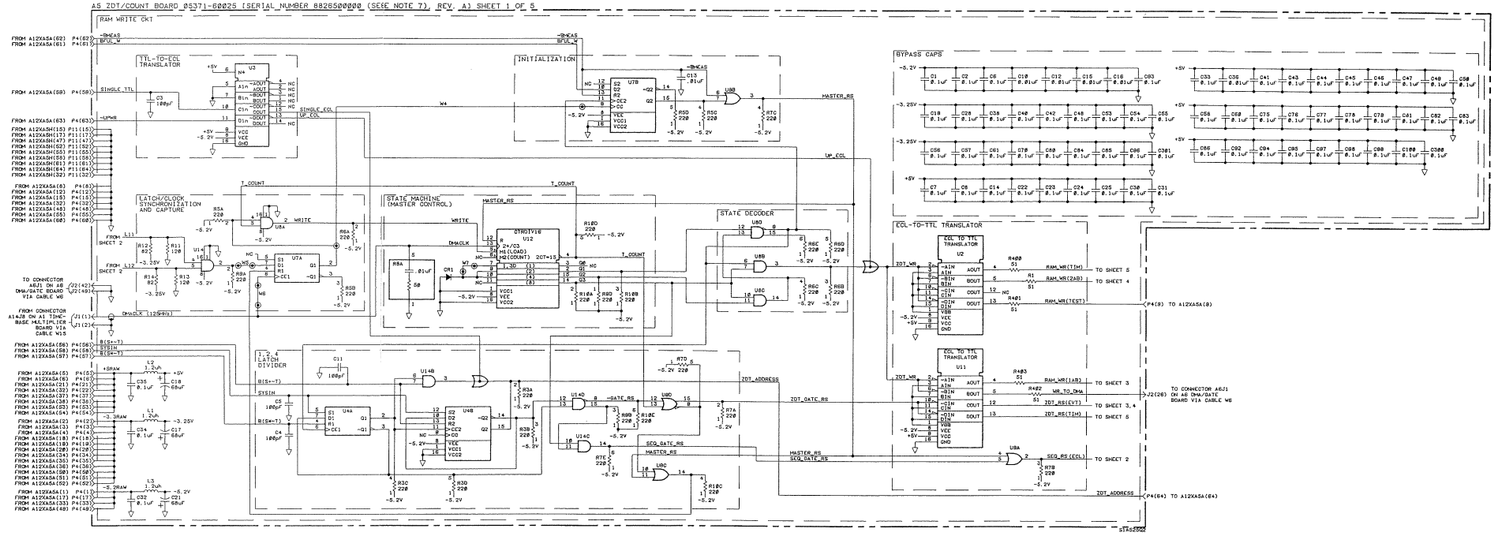
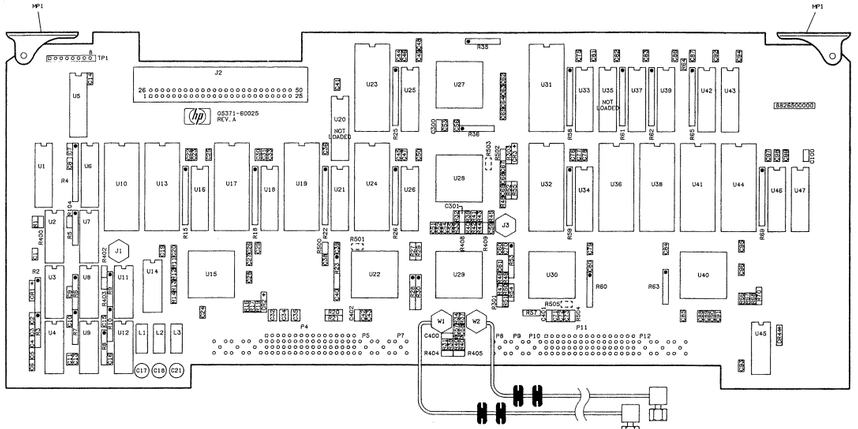


Figure 5-1. Schematic Diagram for 05371-60025 A5 ZDT/Count Board (Sheet 1 of 5)



AS SCHEMATIC DIAGRAM NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD AS ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN FARADS; INDUCTANCE IN HENRIES.
3. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT. AVERAGE VALUE SHOWN.
4. A TILDE ("~") PRECEDING A SIGNAL INDICATES A NEGATIVE-TRUE SIGNAL.
5. THE 05371-60025 BOARDS (SERIES NUMBER 2707, REV. A) ARE MODIFIED AS FOLLOWS:
   A. COAXIAL CABLE, W3, CONNECTS A5U8A(2) TO A5U29(C1). THE COAXIAL CABLE'S OUTER GROUND CONDUCTOR CONNECTS TO THE GROUND SIDE OF A5C1 AT ONE END AND TO A5U29(D1) AT THE OTHER.
   B. JUMPER WIRE W4 CONNECTS A5U7(2) TO A5U7(9).
   C. JUMPER WIRE W5 CONNECTS A5U7(7) TO A5R8A.
   D. JUMPER WIRE W6 CONNECTS A5U5(6) TO A5R8D.
   E. JUMPER WIRE W7 CONNECTS A5U12(7, 9, 10) TO CATHODE OF DIODE A5CR1.
   F. THE FOLLOWING 14.7Ω RESISTORS HAVE BEEN ADDED TO THE COMPONENT SIDE OF PC BOARD: A5R5002, R504 AND R502.
   G. THE FOLLOWING 10Ω RESISTORS HAVE BEEN ADDED TO THE CIRCUIT SIDE OF PC BOARD: A5R501, R505 AND R503.
6. IC'S A5U20 AND U35 ARE NOT LOADED IN PC BOARD. AVAILABLE FOR FUTURE EXPANSION.
7. THIS IS THE SERIAL NUMBER OF THE PC BOARD. ENGINEERING CHANGES ARE KEYED TO THE 5-DIGIT PREFIX OF THE SERIAL NUMBER. TO TRACK ENGINEERING CHANGES THAT MAY HAVE OCCURRED SINCE MANUAL'S LAST PRINTING, REFER TO YELLOW "MANUAL UPDATING CHANGES" SHEETS. FOR MORE DETAILS, SEE "IDENTIFICATION MARKINGS ON PRINTED-CIRCUIT BOARDS" PARAGRAPH IN SECTION 7.

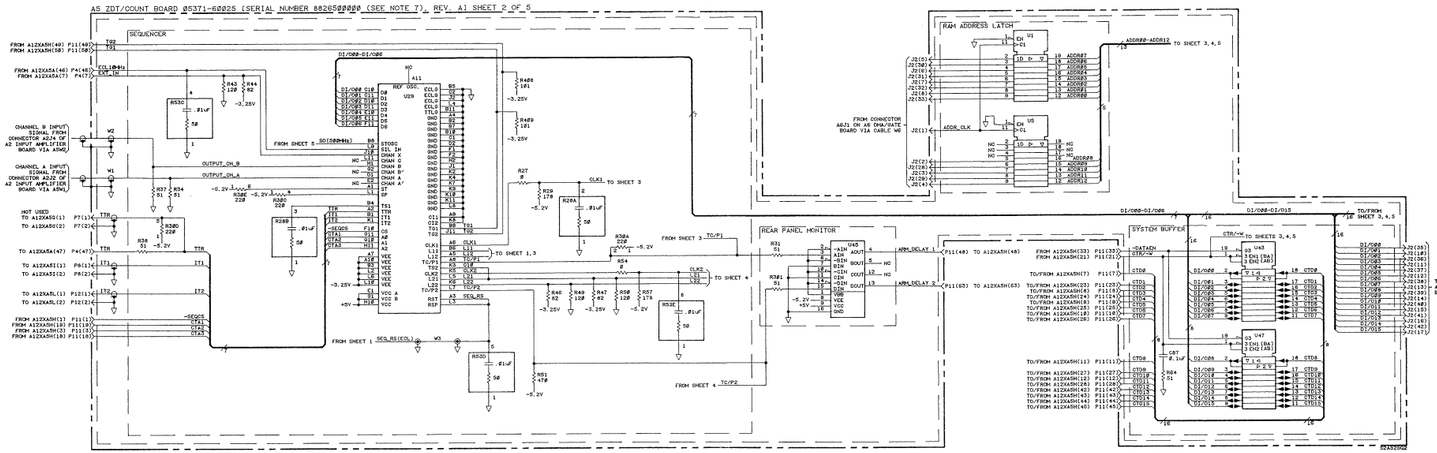
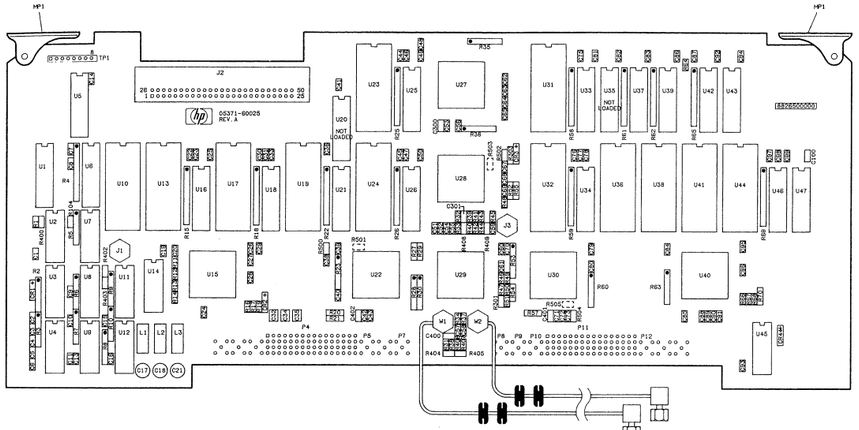


Figure 5-1. Schematic Diagram for 05371-60025 A5 ZDT/Count Board (Sheet 2 of 5)



A5 SCHEMATIC DIAGRAM NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD A5 ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN FARADS; INDUCTANCE IN HENRIES.
3. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT. AVERAGE VALUE SHOWN.
4. A TILDE ("~") PRECEDING A SIGNAL INDICATES A NEGATIVE-TRUE SIGNAL.
5. THE 05371-60025 BOARDS (SERIES NUMBER 2787, REV. A) ARE MODIFIED AS FOLLOWS:
   A. COAXIAL CABLE, W3, CONNECTS A5U9A(2) TO A5U29(11). THE COAXIAL CABLE'S OUTER GROUND CONDUCTOR CONNECTS TO THE GROUND SIDE OF A5C10 AT ONE END AND TO A5U29(11) AT THE OTHER.
   B. JUMPER WIRE W4 CONNECTS A5U7(2) TO A5U7(9).
   C. JUMPER WIRE W5 CONNECTS A5U7(7) TO A5R9A.
   D. JUMPER WIRE W6 CONNECTS A5U5(6) TO A5R9D.
   E. JUMPER WIRE W7 CONNECTS A5U12(7,9, 10) TO CATHODE OF DIODE A5CR1.
   F. THE FOLLOWING 14.7Ω RESISTORS HAVE BEEN ADDED TO THE COMPONENT SIDE OF PC BOARD: A5R5@0, R5@4 AND R5@2.
   G. THE FOLLOWING 10Ω RESISTORS HAVE BEEN ADDED TO THE CIRCUIT SIDE OF PC BOARD: A5R5@1, R5@5 AND R5@3.
6. IC'S A5U@@ AND U35 ARE NOT LOADED IN PC BOARD, AVAILABLE FOR FUTURE EXPANSION.
7. THIS IS THE SERIAL NUMBER OF THE PC BOARD. ENGINEERING CHANGES ARE KEYED TO THE 5-DIGIT PREFIX OF THE SERIAL NUMBER. TO TRACK ENGINEERING CHANGES THAT MAY HAVE OCCURED SINCE MANUAL'S LAST PRINTING, REFER TO YELLOW "MANUAL UPDATING CHANGES" SHEETS. FOR MORE DETAILS, SEE "IDENTIFICATION MARKINGS ON PRINTED-CIRCUIT BOARDS" PARAGRAPH IN SECTION 7.

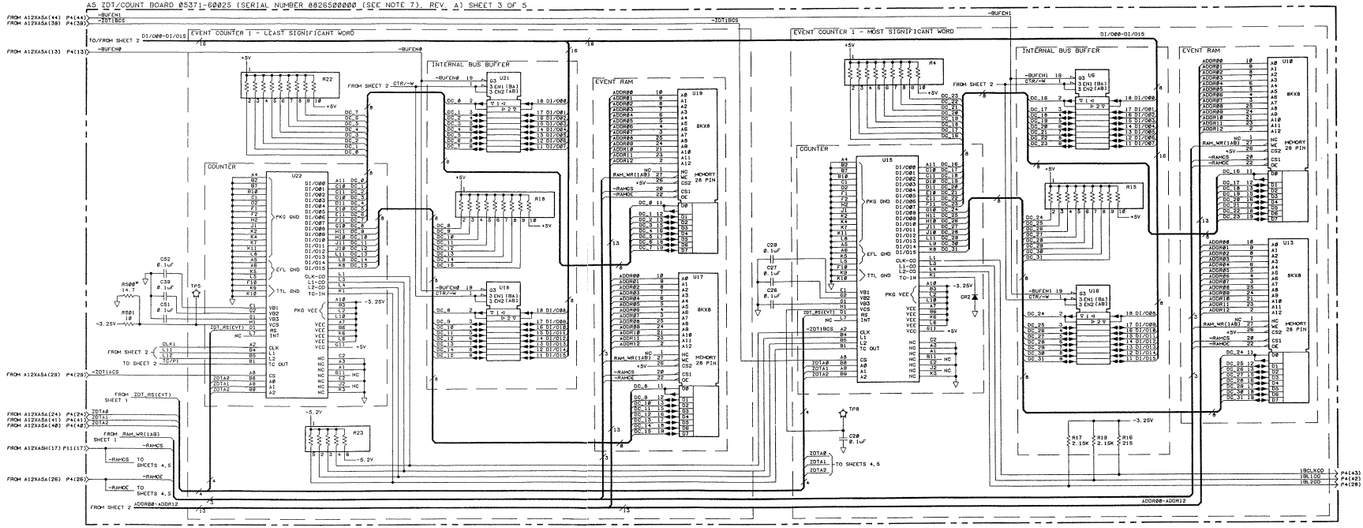
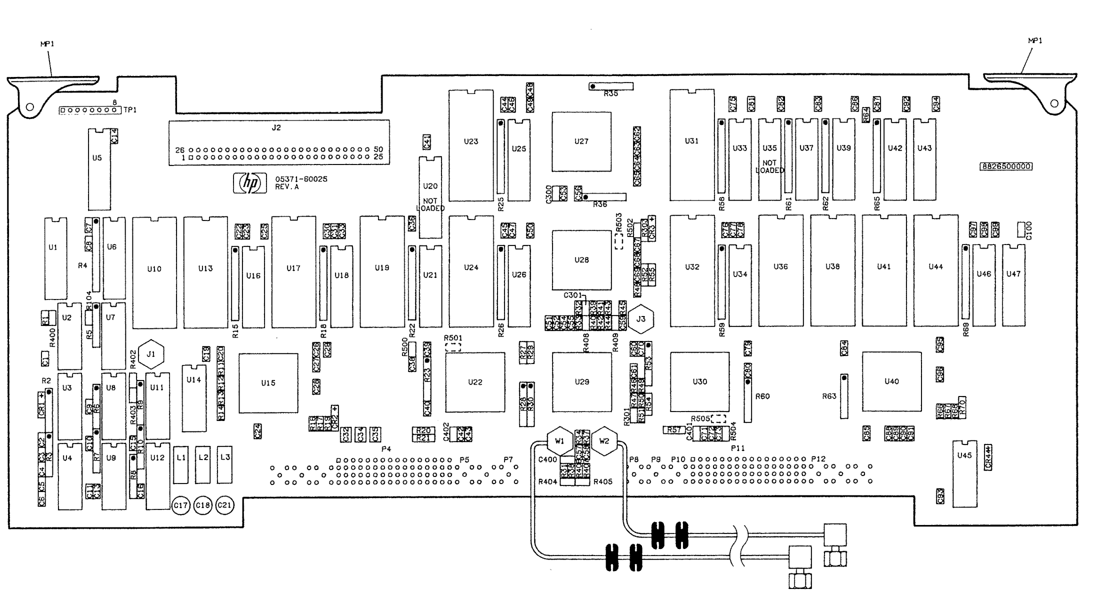


Figure 5-1. Schematic Diagram for 05371-60025 A5 ZDT/Count Board (Sheet 3 of 5)



A5 SCHEMATIC DIAGRAM NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD A5 ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS;
   CAPACITANCE IN FARADS;
   INDUCTANCE IN HENRIES.
3. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT. AVERAGE VALUE SHOWN.
4. A TILDE ("~") PRECEDING A SIGNAL INDICATES A NEGATIVE-TRUE SIGNAL.
5. THE 05371-60025 BOARDS (SERIES NUMBER 2707, REV. A) ARE MODIFIED AS FOLLOWS:
   A. COAXIAL CABLE, W3, CONNECTS A5U9A(2) TO A5U29(C1). THE COAXIAL CABLE'S OUTER GROUND CONDUCTOR CONNECTS TO THE GROUND SIDE OF A5C10 AT ONE END AND TO A5U29(D1) AT THE OTHER.
   B. JUMPER WIRE W4 CONNECTS A5U7(2) TO A5U7(9).
   C. JUMPER WIRE W5 CONNECTS A5U7(7) TO A5R9A.
   D. JUMPER WIRE W6 CONNECTS A5U5(6) TO A5R8D.
   E. JUMPER WIRE W7 CONNECTS A5U12(7, 9, 10) TO CATHODE OF DIODE A5CR1.
   F. THE FOLLOWING 14.7Ω RESISTORS HAVE BEEN ADDED TO THE COMPONENT SIDE OF PC BOARD: A5R500, R504 AND R502.
   G. THE FOLLOWING 100Ω RESISTORS HAVE BEEN ADDED TO THE CIRCUIT SIDE OF PC BOARD: A5R501, R505 AND R503.
6. IC'S A5U20 AND U35 ARE NOT LOADED IN PC BOARD. AVAILABLE FOR FUTURE EXPANSION.
7. THIS IS THE SERIAL NUMBER OF THE PC BOARD. ENGINEERING CHANGES ARE KEYED TO THE 5-DIGIT PREFIX OF THE SERIAL NUMBER. TO TRACK ENGINEERING CHANGES THAT MAY HAVE OCCURED SINCE MANUAL'S LAST PRINTING, REFER TO YELLOW "MANUAL UPDATING CHANGES" SHEETS. FOR MORE DETAILS, SEE "IDENTIFICATION MARKINGS ON PRINTED-CIRCUIT BOARDS" PARAGRAPH IN SECTION 7.

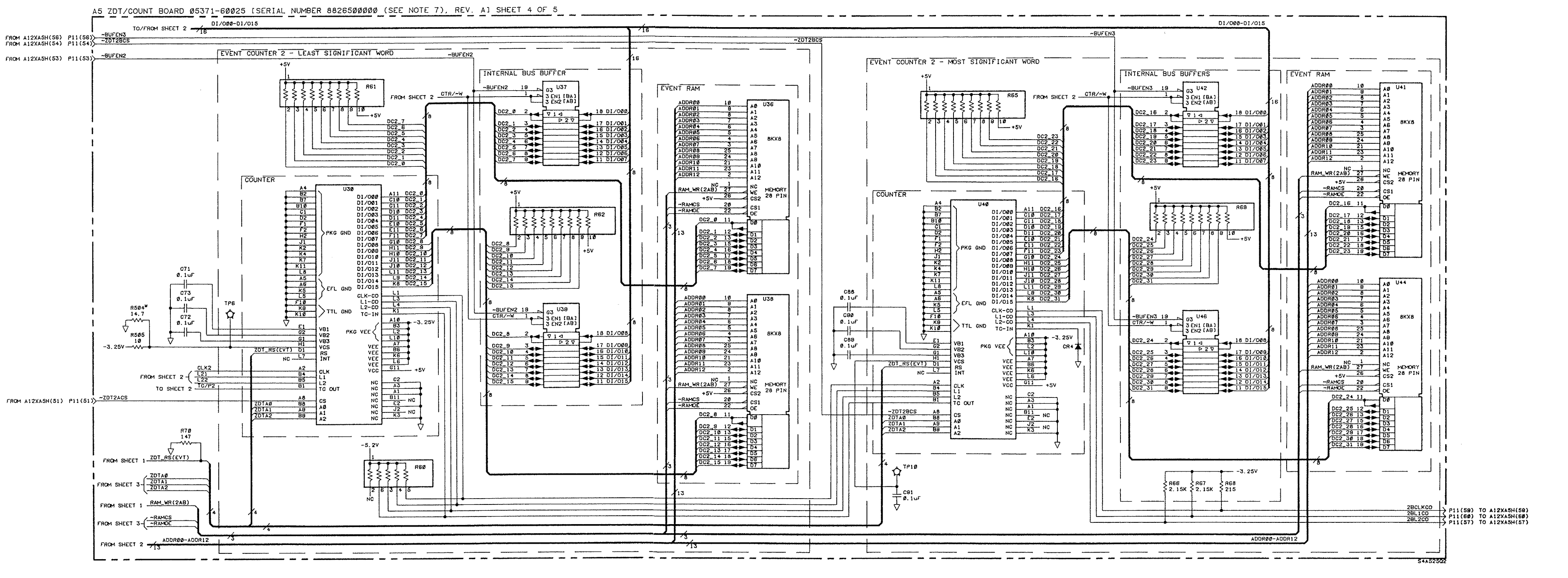
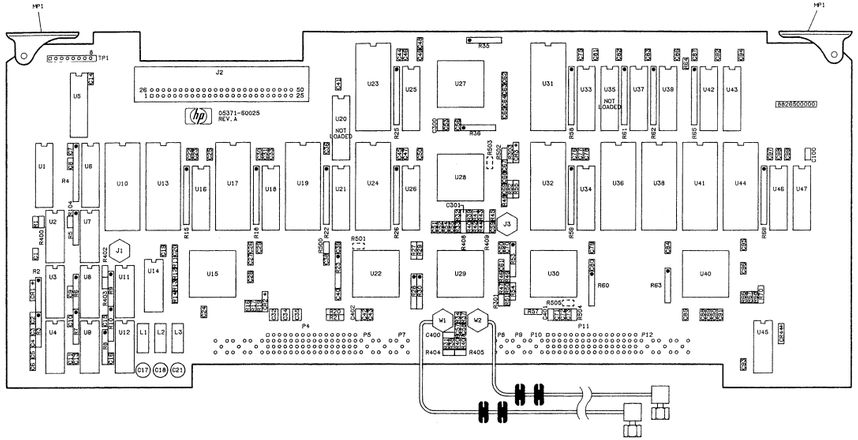


Figure 5-1. Schematic Diagram for 05371-60025 A5 ZDT/Count Board (Sheet 4 of 5)



A5 SCHEMATIC DIAGRAM NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD A5 ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN FARADS; INDUCTANCE IN HENRIES.
3. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT. AVERAGE VALUE SHOWN.
4. A TILDE ("~") PRECEDING A SIGNAL INDICATES A NEGATIVE-TRUE SIGNAL.
5. THE 05371-60025 BOARDS (SERIES NUMBER 2707, REV. A) ARE MODIFIED AS FOLLOWS:
   A. COAXIAL CABLE, W3, CONNECTS A5U8A(2) TO A5U29(C1). THE COAXIAL CABLE'S OUTER GROUND CONDUCTOR CONNECTS TO THE GROUND SIDE OF A5C10 AT ONE END AND TO A5U29(D1) AT THE OTHER.
   B. JUMPER WIRE W4 CONNECTS A5U7(2) TO A5U7(9).
   C. JUMPER WIRE W5 CONNECTS A5U7(7) TO A5R8A.
   D. JUMPER WIRE W6 CONNECTS A5U5(6) TO A5R8D.
   E. JUMPER WIRE W7 CONNECTS A5U12(7,9,10) TO CATHODE OF DIODE A5CR1.
   F. THE FOLLOWING 14.7Ω RESISTORS HAVE BEEN ADDED TO THE COMPONENT SIDE OF PC BOARD: A5R500, R504 AND R502.
   G. THE FOLLOWING 10Ω RESISTORS HAVE BEEN ADDED TO THE CIRCUIT SIDE OF PC BOARD: A5R501, R505 AND R503.
6. IC'S A5U20 AND U35 ARE NOT LOADED IN PC BOARD. AVAILABLE FOR FUTURE EXPANSION.
7. THIS IS THE SERIAL NUMBER OF THE PC BOARD. ENGINEERING CHANGES ARE KEYED TO THE 5-DIGIT PREFIX OF THE SERIAL NUMBER. TO TRACK ENGINEERING CHANGES THAT MAY HAVE OCCURED SINCE MANUAL'S LAST PRINTING, REFER TO YELLOW "MANUAL UPDATING CHANGES" SHEETS. FOR MORE DETAILS, SEE "IDENTIFICATION MARKINGS ON PRINTED-CIRCUIT BOARDS" PARAGRAPH IN SECTION 7.

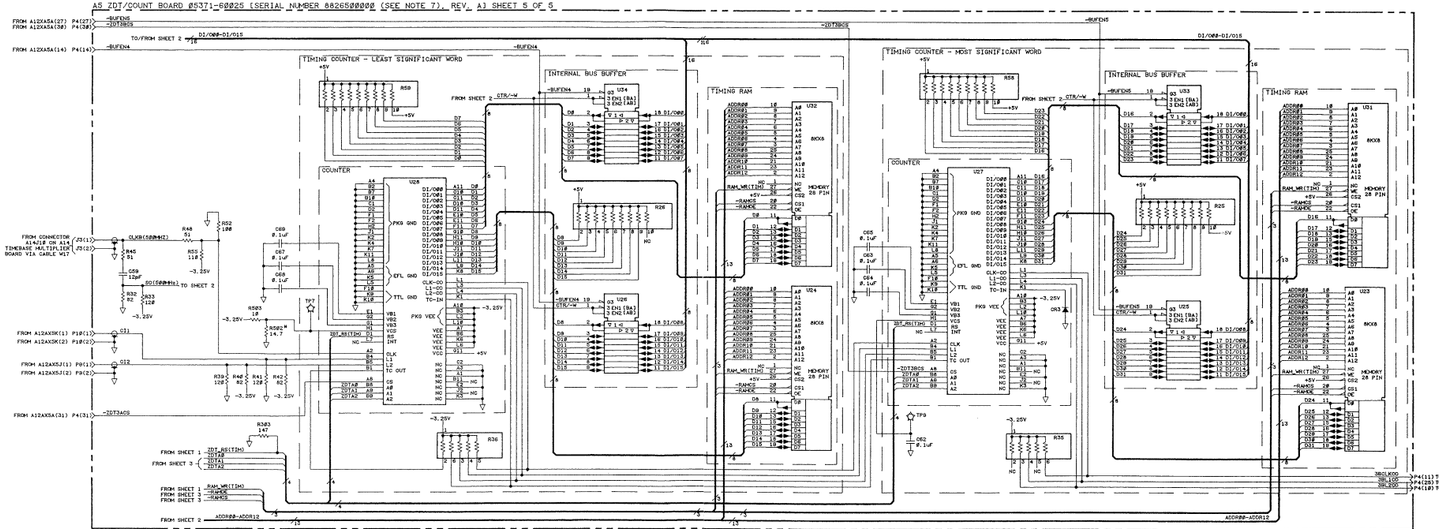


Figure 5-1. Schematic Diagram for 05371-60025 A5 ZDT/Count Board (Sheet 5 of 5)

6 OVERALL THEORY

SECTION 6
THEORY OF OPERATION

6-1. INTRODUCTION

The HP 5371A Frequency and Time Interval Analyzer is a high-performance universal frequency counter and a high-precision time interval counter analyzer. It has two matched input channels, Channels A and B, capable of measuring frequencies between 0 and 500 MHz. Time interval measurements can be made with a ±200 picosecond resolution.

The HP 5371A can make continuous frequency and totalize measurements, and consecutive time interval measurements. The term "continuous" means that NO pause occurs between measurement of the input signals. A method of accurately sampling the value of a high-speed counter without the need to interrupt the counting process is used. Conventional counters require that the input signal (or events) be temporarily disconnected during the time that measurement data is processed and sent to the display. The continuity of the counting process is lost during this "dead time". But during the continuous count process, incoming events are not disconnected from the measurement source. The 5371A can be sampled at various times during the measurement without introducing "dead time" and thus affecting the final results of the measurement. The signals used to start or stop a measurement, called latches, are derived from external events under the control of the user. The time duration between the start and stop latches is computed by subtracting two latched counter values and then multiplying the difference by the period of the 500 MHz reference oscillator. The HP 5371A can take a sample size of input measurements, process them mathematically and statistically, and then display the results to the front-panel CRT.

6-2. HP 5371A PERFORMANCE HIGHLIGHTS

A. DC to 500 MHz frequency.

B. 150 ps rms single-shot resolution (improves when taking repetitive measurements).

C. Continuous frequency, phase and time-interval measurements from which spectral characteristics of the input signal can be extracted.

D. Sampling intervals as low as 100 ns.

E. Easy-to-use menu structure via front panel CRT display.

F. Flexible triggering, allowing the user to consistently measure the same portion of a waveform;

- Trigger after a specified number of events,
- Trigger after a specified time delay,
- Trigger on the edge of an external signal ("EXTERNAL ARM"),
- Or after any combination of the previous three.

G. HP-IB with transfer rates greater than 20,000 measurements in binary format per second.

H. Counter RAM, under direct-memory-access control, capable of storing/accessing up to 1000 measurements at a DMA rate of 100 ns.

I. Trigger levels set automatically depending on mode.

The characteristics that set the HP 5371A apart from conventional counters are the continuous count feature and the built-in analysis functions.

6-3. Continuous Count

As mentioned before, the continuous count feature allows the counter to measure frequency continuously, with NO pauses between measurements.

Contrast this to a standard design which requires the measurement to end by closing the gate, allowing the circuitry to settle, processing and displaying the measured results, and then reopening the gate for the next measurement.

The HP 5371A performs two basic types of continuous measurements:

A. "Back-to-Back" Continuous Measurements — Measurements are contiguous with one another and are related in time. In other words, the "stop" of the nth measurement is the "start" of the n+1 measurement. The measurement sample-interval must be between 100 ns and 8 seconds (4 seconds for 2 measurement results).

B. "Individual" Continuous Measurements — After arming occurs, the first, and only the first, "start" and "stop" trigger events cause time-sampling to occur. Subsequent "start" and "stop" trigger events are ignored until the arming condition is once again satisfied. All time samples are related to each other in time. The start-to-stop (measurement) must be less than 8 seconds and the stop-to-start time must be at least 200 ns.

6-4. Consecutive Time Interval

The HP 5371A can measure and store up to 1000 events for each of the input channels, A or B. The input frequency limits for measurements made on either Channel A or Channel B is 10 MHz, or 5 MHz when measurements are made on both channels. Event rates greater than the 5 or 10 MHz limits mentioned before, will be averaged.

6-5. Continuous Totalize

This feature allows the HP 5371A to process and display data, while continuing to totalize the input signal, and output the current totalized count. The processing and display process does not affect the total count or cause the loss of any measured input event.

6-6. Analysis Functions

A.	Time Variations	Graphically shows the variation of measured values versus the time each measurement was acquired. The HP 5371A displays plots of frequency variation with time or time interval (i.e., phase, period, pulse width, etc.) variation with time.
B.	Histograms	Graphically shows the number of times a given measurement value occurs versus the ordered range of these values. The measured values can be in either units of time, frequency, duty cycle (percentage), peak amplitude, or totalize count. Plots can be produced for each block, or cumulatively, on the entire set of blocks taken during a measurement session.
C.	Event-timing Graphs	Graphically shows the starting and ending time of each measurement during the last block of a measurement session. The upper tic marks are the start events and the downward tic marks are the stop events. Markers allow the measurement of time between any two trigger events.

D. Limit Testing

Allows the user to set upper and lower limits on the processed counter measurement. When a measurement falls outside the set limits, it will be indicated as such on the front-panel display or over the HP-IB interface.

E. Comprehensive Statistics

Statistics can be generated for all measurement functions and can be enabled or disabled separately for Channel A or B. Statistics can be taken after each block, or cumulatively, over the entire set of blocks made during the measurement session. This allows the user to statistically analyze up to 2 billion measurements at a time. Mean value, minimum value, maximum value, Standard Deviation, rms, and Root Allan Variance can be displayed depending on the display mode selected.

6-7. GENERAL THEORETICAL DESCRIPTION

In order to better understand what the HP 5371A can do, a conceptual block diagram is helpful. See *Figure 6-2*.

Where conventional counters count input events and a timebase and then compute a result, the HP 5371A analyzer uses an all new approach called continuous measurement.

Signals enter a wide-bandwidth (1 GHz) front-end that preserves pulse fidelity and allows triggering on pulses as short as 1 ns. Then they are routed to one or more of three continuous-counting registers. HP has patented a design that lets count totals be read on-the-fly without interrupting the counting process. These 32-bit count registers are never reset from one measurement to the next.

The internal memory samples the values in the count registers as fast as once every 100 ns. This is where the terms "time-sampling", time-tagging", or "time-stamping" originate in the HP 5371A. The memory can store 1000 time-tags for front panel controlled measurements and up to 4095 using HP-IB access. Each event may be spaced up to 8 seconds apart, and 1000 events may be tagged, each with a resolution of 150 ps rms. This approach offers high precision, independent of the total time of the measurement.

The memory contains "time stamps" for when the edges occurred, or the number of zero-crossings and time, depending on the measurement. This raw data is available via HP-IB in the binary format output mode. To obtain useful results, the raw time stamp information must be processed. The analysis section firmware does this in the HP 5371A, or the user can do the calculations in an external controller. The analysis firmware calculates the measurement results desired (frequency, phase, etc.), calculates statistics, and drives the CRT display for graphical or numerical results.

Figure 6-1 shows how the HP 5371A measures frequency and time intervals by time sampling. In frequency mode, the count register samples show the time between sample points and the number of zero-crossings of the modulated carrier. Remember the count registers are counting up to 500 MHz continuously during this process. The average frequency between samples is calculated and plotted.

The second part of *Figure 6-1* shows the concept of "time-stamping" an edge. The values are stored in memory and then the time between any set of edges can be easily computed. The event timing graph is useful for doing such analysis.

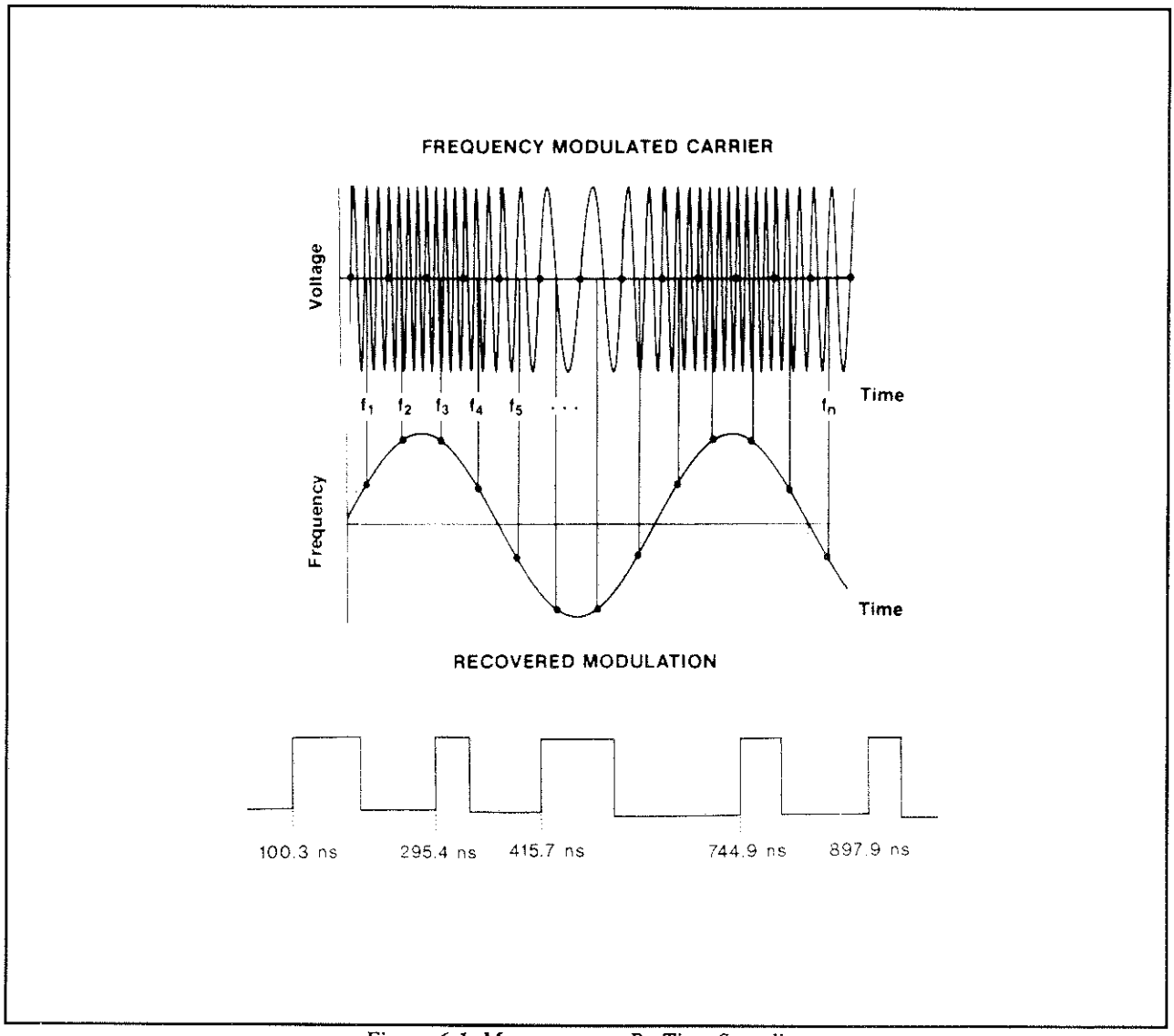


Figure 6-1. Measurements By Time Sampling

6-8. MEASUREMENT ACQUISITION MODES

The HP 5371A has two measurement acquisition modes: continuous and non-continuous. In the continuous mode, the user can select a measurement block size having between 1 and 1000 measurement samples. Continuous measurements are performed in blocks, with the processing performed on the samples after the block of measurements is complete. Display updating and HP-IB transfers occur only after the block of measurements have occurred. This process minimizes the dead time between the blocks of measurements. While in the non-continuous mode, block measurement sizes between 1 and 1000 may also be selected. Measurements are made one at a time with intermediate processing performed as necessary for front-panel CRT and graphical updating after each measurement. This process is repeated until all measurements in the block have been taken. Then full processing (statistical results) is performed on all samples in the block. In both modes, the final result can be transferred as either formatted or unformatted data. The A7 assembly's 68000 μP formats the measurement data, which is derived on the A5 ZDT/Count Board, into a single result (i.e., Frequency or Time Interval) and sent either to the counter's CRT display or to the HP-IB port, where hard copy of the display can be generated via a printer or plotter. Unformatted data consisting of event and time data obtained from the A5 ZDT/Count Board's counting hardware can be output (dumped), under control of the A6 DMA/Gate Board, directly to the HP-IB output port, where a controller can perform the formatting.

6-9. Non-Continuous Mode

After the Sequencer detects the Start Arm, the next input edge is sent to ZDT Counter #1 as a CLK and as L11. L11 latches the initial value of the counter and arms RAM-Write circuit. When the Sequencer detects the Stop Arm, the next input edge is sent to ZDT Counter #1 as L12. This latches the final counter value and causes the RAM-Write circuit to generate a write pulse that copies the contents of Latch 11 (counter's value at the Start) and Latch 12 (the counter's value at the Stop), the Timing Counter ZDTs Latch 1 (start) and Latch 2 (Stop), and the Start/Stop interpolated binary code. This write pulse causes reset signals to be sent, after the data has been stored in RAM, to the A5 Sequencer, A4 interpolator, and counters. The write pulse also increments the A6 Count Address Generation counter. This count is preset to its terminal count (TC) minus 1. This means the increment causes a TC to be generated. The TC is latched and generates an interrupt (~INTX). The interrupt notifies the 68000 μP that the measurement is complete and that data is ready to transfer. The transfer of data from the counter RAMs is controlled jointly by the A7 Processor and A8 I/O Controller Board. The 68000 uP processes the data, displays it on the front-panel CRT, and starts another measurement.

6-10. Continuous Mode (Using Interval Sampling)

Prior to the start of a measurement, the 68000 μP programs the System Timing Controller (STC), U41, to generate interval pulses (TG1 or TG2) that are used to sample or latch the count values once each interval. The Sequencer sets L11 high to arm the RAM-Write circuit. The microprocessor presets the A6 Count Address Generation Counter to its terminal count (TC) minus the user-defined number of measurements in measurement block. The measurement begins when the Sequencer detects the "Start" arm. The next input edge is sent to the ZDT Counter #1 and to the System Timing Controller as the Timing Trigger signal (TTR). This requests that pulses of programmed intervals (600 ns to 8 seconds) be sent, after a hardware delay of 600-800 ns, to the Sequencer as either TG1 or TG2. After detection of either TG1 or TG2, the Sequencer sends L12 to ZDT Counter #1. L12 latches the current value of the counter without interrupting the counting process. L12 causes the RAM-Write circuit to write the latched counter value and the timing information into the measurement RAMs. In addition, the write pulse to generate reset signals that allow the ZDT counters to receive another latch signal, the Sequencer to initiate another sample, and the interpolator circuits to perform another measurement. It should be emphasized that these reset signals do not reset the ZDT Counters. The RAM-Write pulse increments the A6 Count Address Generation Counter. The ZDT counter continues to count events until the next TG1 or TG2 edge is received from the STC. The process is repeated until the programmed number measurements have been completed. When completed, the A6 Count Address Generation Counter sends a TC pulse to the 68000 μP informing it that the measurement block is complete and that the measurement data is ready to transfer from the measurement RAMs to A8 memory for processing. After the block is processed, the next block of measurements begin.

6-11. Frequency Sampling

The HP 5371A actually measures the time it takes for an integer number of cycles to occur (or integer multiples of 2 pi radians of phase). Once the number of cycles and number of seconds is measured, the frequency is known during the sample interval. The unique contribution of the HP 5371A to frequency sampling is that it samples frequency in a continuously timed, "back-to-back" fashion for up to 1000 measurements (4095 when remotely controlled). There is no processing time, or "dead time", between these measurements and the timing relationships of all these relationships are known. The processing is done after the measurement "block" has been acquired. The 5371A can sample frequencies up to 500 MHz in this manner. For a 1 second sample interval, frequency resolution is a constant 10 digits across the 500 MHz bandwidth. Sample intervals may be varied from 100 ns to 8 seconds, with a corresponding change in measurement resolution with change in sample interval duration. Averaging several frequency measurements can significantly enhance this resolution. The time/phase sampling reveals information unattainable with traditional time interval counters. When sampling the time from clock to data continuously, not only can the statistics of variation be recovered. Once the data is collected, the HP 5371A can display the results as measured time interval vs time or in histogram format, which can include the calculation of statistics (mean, standard deviation, root Allan variance, etc.).

6-12. Measurement Blocks and Their Processing

Continuous measurements are made in "blocks" of up to 1000 measurements. Then acquisitions stop and results are processed by the HP 5371A or output to an external computer. When using an external computer with the HP 5371A to process the measurement data, up to 4095 measurements can be made per block.

For histogram and statistical analysis of the measurements, up to two million blocks of 1000 measurements can be taken in one measurement session. This allows up to two billion measurements to be cumulatively analyzed per session.

The number of measurements per block can range from 1 to 1000 and the number of blocks per session can range from 1 to 2,000,000 as long as the total measurements per session does not exceed 2,000,000,000.

For dual-result measurements, such as Frequency A&B, these ranges are reduced by half (i.e., 1 to 500 measurements per block) since two sets of data are taken per measurement. This restriction applies to Frequency A&B, Period A&B, and Totalize A&B measurements.

6-13. HP 5371A MEASUREMENT FUNCTIONS

The HP 5371A measurement capabilities fall into three broad categories: Frequency, Totalize, and Time Interval. Frequency and Period measurements are determined by computing the ratio of an integral number of input events to the time period. The process is based on a reciprocating counting technique with digital ("flash") interpolation for finer resolution. A Totalize result is simply the number of events that occur within a given time period. Time Interval (TI) measurements are the elapsed time between two specific events. The TI measurement is also used to determine Risetime, Falltime, Pulse Width, Duty Cycle and Phase.

6-14. Frequency and Period

Frequency and Period are armed and measured in the same way. They differ only in the computation of the measurements (Frequency = 1/Period). Single-channel measurements can be made on either Channel A or B. Dual-channel measurements (i.e., A&B, A/B, B/A, A-B, and B-A) are made simultaneously (i.e., both channels at the same time), with full accuracy on both channels. Both Single- and Dual-channel measurements can be made "back-to-back". The processor calculates the measurement results using the following relationships:

- Frequency = Events/Time
- Period = Time/Events

Frequency/Period measurements are taken over a user-specified sample interval that is synchronized to the input signal's trigger events. If this interval is equal to the period of the signal, then a single cycle measurement is performed. If the interval is shorter than the period of the signal, then the sample interval defaults to the period of the signal, resulting in a single cycle measurement. If the interval is longer than the period of the signal, the calculations will be the averaged value of the Frequency/Period during that time. For Dual-channel measurements (A&B, etc.), the slower of the two input signals will determine the sample interval.

Automatic arming sets the sample interval to 100 ns for Single-channel measurements. Therefore, all Frequency/Period measurements of 10 MHz and below are single cycle measurements and measurements above 10 MHz are averaged measurements. For Dual-channel measurements these numbers become 200 ns and 5 MHz. Non-continuous arming modes allow sample intervals of less than 100 ns.

6-15. Totalize

Single-channel Totalize measurements can be made on Channels A or B. Dual-channel Totalize measurements (A&B, A/B, B/A, A+B, A–B, and B-A) are all made simultaneously. These are all "back-to-back" measurements. Totalize measurements are made over a user-specified sample interval that is not synchronized to the input signal's trigger events. For all arming modes, except Manual, the count total is reset with each measurement. For Manual arming, the cumulative count total is displayed until the RESET key is pressed, regardless of the number of times the count is interrupted.

- Totalize = Event (Stop) – Event (Start)

6-16. Continuous Time Interval

This measurement is similar to a period measurement since it can only be made between like trigger events (input voltage and slope) on a given input channel (A or B). It does provide Holdoff arming options that are not available for Period. Continuous Time Interval is a "back-to-back" measurement and all arming modes are continuous. When the sample interval is longer than the period, the measurements are not automatically averaged. The measurement results displayed will be the number of events (periods) that took place during the sample interval and the exact time of the interval.

6-17. Time Interval

This measures positive time intervals from 10 ns to 8 seconds in duration with 150 rms resolution. Measurements can be made from channels A→B, B→A, A or B, where the first channel listed is the Start channel and the second is the Stop channel. These are "individual" type measurements with a 200 ns minimum spacing requirement between measurements. If the spacing between time intervals is less than 200 ns, trigger events will be counted but not timed. When 200 ns has elapsed, the next time interval will be measured. Displayed results will show the time interval measurements and, on the Numeric and Graphic screens, the number of trigger events that occurred between the two time intervals. Automatic arming allows the measurement of every time interval received, provided the 200 ns spacing requirement is met. Interval Sampling, Repetitive Edge Sampling, and Edge/Interval arming allow the skipping of unwanted time interval measurements. This function operates in one of three modes: +TI, ±TI, or Continuous TI.

6-18. ±Time Interval

With this measurement, both positive and negative time intervals of up to 4 seconds duration can be measured. Measurements can be made from channels A→B, B→A, A or B, where the first channel listed is defined as the Start channel and the second is the Stop channel. If a Stop trigger event occurs before a Start trigger event, the time interval displayed will be negative. These are "individual" measurements with a 200 ns minimum spacing requirement. If the spacing between time intervals is less, the displayed results will be the same as for Time Interval. Automatic arming allows the measurement of every time interval provided the 200 ns spacing is met. Other arming modes allow the skipping of unwanted time interval measurements. The unique Parity arming modes allows the user to specify a relationship (a pairing) between two similar signals at the beginning of a measurement session. This relationship is then held throughout the session, even if the spacing between measurements becomes less than 200 ns. All three Parity arming modes (Parity Sampling, Edge/Parity, and Repetitive Parity) establish the pairing relationship after the arming of the first block and before the first measurement is made. The first trigger events received on Channel A and B become the pair. From that point on, every subsequent pair produces an internal signal that synchronizes all further arming.

A. In +TI A→B measurements, the A signal always acts as the start gate and the B signal as the stop signal. In +TI B→A measurements, the B signal always acts as the start gate and the A signal as the stop signal.

B. In ±TI measurements, either the A or B signal can act as the last start gate or stop gate. Whichever signal occurs first will act as the start gate with the other acting as the stop gate. In some ±TI measurements, a phase-detector found in the A5 ZDT/Count Board's Sequencer IC will determine which of the two input signals, A or B, actually occurs first. The start and stop gates will occur such that the time between events A and B will be measured, regardless of which event actually occurs first. For all ±TI measurements, if the B event occurs first, the result will be displayed as a negative time interval (–TI).

Time Interval A→B or B→A in +TI or ±TI modes allows the measurement and storage of the time of occurrence of every sequential input event on Channel A and B, up to a maximum measurement rate of 5 MHz.

C. The Continuous Time Interval mode measures and stores the time of occurrence of every sequential input event on a single channel up to a maximum measurement rate of 10 MHz. For dual-channel measurements, the average frequency of both channels must be the same to achieve the maximum rate of 5 MHz. When the average frequencies differ, the maximum Continuous count rate is reduced to the lower of the two input frequencies. Measurement results are calculated using the following relationship:

- Time Interval = Time (Stop) – Time (Start)

6-19. ±Pulse Width

The pulse width of an input signal can be measured using Channel A input. Common A input mode is used with either a default trigger level setting of 50% or a user-selected trigger level. Results are calculated using the following relationships:

- Positive Pulse Width = Time (50% point of negative slope) – Time (50% point of positive slope)
- Negative Pulse Width = Time (50% point of positive slope) – time (50% point of negative slope)

The Start and Stop points are automatically set on opposite slopes to 50% of the input signal's peak-to-peak amplitude. The trigger level percentage may be modified by the user or trigger level voltages may be set. Every other pulse width is measured since one width is required to arm the measurement. ± Pulse Widths are "individual" measurements with a 200 ns minimum spacing requirement and they can be made on Channel A only. If the spacing between the measurements is less than 200 ns, the displayed results show the count of the number of events missed as well as the timed results.

6-20. Risetime/Falltime

The risetime and falltime of a signal can be measured on Channel A input only. Common A input mode is used with either a default trigger level setting of 50% or a user-selected trigger level. Results are calculated using the following relationships:

The Start and Stop points are automatically set to 20% and 80% of the input signal's peak-to-peak amplitude. Percentages may be modified by the user or trigger levels may be set.

- Risetime = Time (80% point of positive slope) – Time (20% point of positive slope)
- Falltime = Time (20% point of negative slope) – Time (80% point of negative slope)

6-21. Duty Cycle

The Duty Cycle measures the positive pulse width as a percentage of the signal's period. This is an "individual" measurement with a 200 ns minimum spacing requirement and it can be made on Channel A only. The measurement is a combination of two measurements: a Period measurement and a Positive Pulse Width measurement. Both meas-

urements are made simultaneously at the 50% point of the signal. The trigger level percentage may be modified by the user or trigger level voltages may be set. Every other period is measured since one period is required to arm the measurement. If the period is less than 200 ns, the instrument will period average over the 200 ns.

The duty cycle of a signal can be measured on Channel A input. Common A input mode is used with either a default trigger level setting of 50% or a user-selected trigger level. Results are calculated using the following relationship:

- $\text{Duty Cycle} = \dfrac{\text{Time (50\% point of negative slope)} - \text{Time (50\% of positive slope)}}{\text{Period}}$

6-22. Multiple Period Phase Measurement

This function measures the relative phase of two input signals by determining the time interval between their respective edges and each signal's frequency. Results are calculated using the following relationship:

- $\text{Phase} = \dfrac{\text{Time (Channel B)} - \text{(Channel A)}}{\text{Period}} \times 360°$

Phase measurements require a reference signal, which can be supplied to either Channel A or B. The measurements available are Phase A Relative to B, or Phase B Relative to A, expressed in degrees. This measurement is the combination of two measurements: a Period measurement and a ±Time Interval measurement. The Period measurement is performed on the reference signal while a simultaneous ± Time Interval measurement is being performed between the positive edges (50% points) of the two signals. If the reference signal's edge occurs before the test signal's edge, the Phase is positive. All phase changes are referenced to the first measurement in the block, so measurements of more than 360° are possible within a block.

6-23. Peak Amplitude

This function measures the minimum and maximum amplitudes of the input signal. This is a non-continuous, free-running measurement of Channel A or B peak-to-peak amplitudes. AC voltages at frequencies of 1 kHz to 200 MHz with amplitudes of 200 mV to 2 V p-p can be measured. The measurement time is 100 ms and the time between measurements is 100 ms. DC voltage measurements, within the ±2 V range of the inputs (±5 V with the 2.5:1 attenuator selected), can also be made.

6-24. ARMING AND GATING OVERVIEW

Arming provides control over when a measurement block begins and when measurement sampling occurs within that block. When the HP 5371A is "armed", it is ready to start or stop measuring at the next edge which satisfies the trigger condition. This does not mean it has started measuring.

The HP 5371A uses two methods for acquiring measurement samples, continuous or non-continuous gating. The arming mode determines if a measurement is made using continuous or non-continuous gating. Measurements are armed or gated by using any number of different sources; settings entered through the front panel keypad, data sent over through the HP-IB interface, Channel A & B inputs, External Arm input, 500 MHz reference clock, and the gate signals (TG1 & TG2) produced by the A6 assembly's System Timing Controller. The term "start gate" refers to the event or condition that actually starts the measurement process. The term "stop gate" refers to where the actual measurement process ends. With regard to non-continuous gating, the technique used in traditional counters, the term "start arm" refers to the conditions that must be satisfied before a "start gate" is accepted. Similarly, "stop arm" refers to the conditions which must be satisfied before a stop gate is accepted. A start arm precedes the beginning of each measurement and a stop arm precedes the end of each measurement. Following each measurement, the data is processed and sent to the counter's display. For continuous gating, the term "block arm" refers to the conditions that must be met before a "start gate" can be accepted, initiating a block measurement. The block measurement start point can be automatic or it can be delayed (Holdoff) until user-defined conditions are satisfied. Sample arming refers to the conditions that must be satisfied before each sample within a block of measurements is taken. These sampling points (the individual measurement stop points) can be automatic or delayed until user-defined conditions are met. The

measurements in each block are collected in a continuous stream before processing and being sent to the counter's display. Up to 1000 measurement samples can be taken in each block for single channel measurements (or up to 500 for two-channel measurements). A block arm precedes the start of each block of measurements and a sample arm precedes each measurement taken within the block.

6-25. Major Arming Mode Categories

There are 23 different arming modes available in the HP 5371A and can be divided into four major categories.

1. Automatic mode — measurements are made as soon and as fast as possible.

2. Holdoff mode — the start of the measurement block is held off but the measurements within the block are made as quickly as possible.

3. Sampling modes — the block starts as soon as possible but the measurements within the block are paced.

4. Holdoff/Sampling modes — both the block and measurements within the block are paced.

"Holdoff" applies to when a block of measurements begins and "Sampling" applies to when the measurements are armed to be made within the block.

There are seven non-continuous arming modes. For these modes arming primarily controls the measurements' duration as opposed to continuous measurements where arming controls their pace. The "block/measurement" arming becomes "start/stop" arming of a single measurement rather than a series of measurements.

6-26. HOLDOFF (BLOCK) ARMING CAPABILITIES

There are three ways to control when a block of measurements will be started. Once the block is started, measurements are made as quickly as possible.

1. Edge Holdoff — the measurement series is armed to start after a user-defined trigger event (input voltage and slope) on Channels A, B, or External Arm inputs.

2. Time Holdoff — similar to Edge Holdoff except that a user-specified time delay is added between the trigger event edge and the arming of the measurement series.

3. Event Holdoff — similar to Edge Holdoff except that a user-specified number of Channel A or B events is added between the trigger event edge and the arming of the series.

6-27. SAMPLE (MEASUREMENT) ARMING CAPABILITIES

There are five basic ways to control the pace at which measurements are made within a block. The block will start automatically.

1. Interval Sampling — sampling is armed at a user-specified rate (interval of time). The interval is referenced from either the arming of the block or the end of the previous interval.

2. Time Sampling — performs a non-continuous frequency or period measurement with a user-specified sample interval. The sample-interval time resolution is more precise in this mode than for Interval Sampling. The measurement begins when the HP 5371A is ready.

3. Cycle Sampling — a user-specified number of Channel A, B, or 2 ns timebase events (cycles) is used to determine the sample sizes. Choices for the number of events is restricted to 2^4, 2^8, 2^{12}, 2^{16}, 2^{24}, or 2^{28}.

4. Edge Sampling and Repetitive Edge Sampling — sampling is armed to occur after a trigger event (edge) on Channels A, B or External Arm. This is called "Edge Sampling" for frequency, period, and totalize measurements, and "Repetitive Edge" for time interval measurements.

5. Parity and Repetitive Parity Sampling — Parity Sampling occurs after a parity signal is generated. The block will start automatically. Repetitive Parity Sampling occurs after an edge on Channels A, B, or External Arm is received and a parity signal is generated. The block will start automatically. Both parity arming modes are used for ± Time Interval measurements only.

6-28. HOLDOFF/SAMPLE ARMING CAPABILITIES

The following 12 modes are basically combinations of the Holdoff and Sample modes. Holdoff will arm the start of the measurement block and Sample will set the pace at which the measurements are made within the block. For non-continuous measurements, Holdoff (Start) arms the beginning of a single measurement and Sampling (stop) arms its end.

1. Edge/Interval — measurements are armed to start after an edge on Channels A, B, or External Arm and arming is paced by the user-specified interval.

2. Edge/Time — a non-continuous mode that arms a measurement to begin after an edge on Channels A, B, or External Arm and to end after a user-specified time.

3. Edge/Edge — measurements are armed to start after an edge on Channels A, B, or External Arm and are paced by an edge on Channels A, B, or External Arm.

4. Externally Gated — a non-continuous mode that uses a positive or negative pulse width of a signal on Channels A, B, or External Arm to arm the beginning and end of the measurement. The minimum time between measurements is only 200 ns.

5. Edge/Cycle — measurements are armed to start after an edge on Channels A, B, or External Arm and arming is paced by the user-specified number of Channel A, B, or internal timebase (2 ns) events (cycles). Choices for the number of events is restricted to 2^4, 2^8, 2^{12}, 2^{16}, 2^{24}, or 2^{28}.

6. Edge/Event — a non-continuous mode that arms a measurement to begin after an edge on Channels A, B, or External Arm and end after a user specified number of Channel A or B events.

7. Edge/Parity — measurement block is armed to start after an edge on Channels A, B, or External Arm is received and a parity signal is generated. The block will start automatically. The Edge/Parity arming mode is used for ± Time Interval measurements only.

8. Time/Interval — measurements are armed to start after a user-specified time that is referenced to an edge on Channels A, B, or External Arm. The arming of the measurement series is paced by a user-specified interval.

9. Time/Time — a non-continuous mode that arms a measurement to begin after a user-specified time that is referenced to an edge on Channels A, B, or External Arm. The measurement is armed to end after a separately set, user-specified time that is referenced to the same edge.

10. Event-Interval — measurements are armed to start after a user-defined number of Channel A or B events which are referenced to an edge on Channels A, B, or External Arm. The measurement arming is paced by a user-specified interval.

11. Event/Event — a non-continuous mode that arms a measurement to begin after a user-specified number of Channel A or B events and is armed to end after a separately specified number of events. Both are referenced to an edge on Channels A, B, or External Arm and the "start" must occur before the "stop".

12. Manual — a non-continuous mode for use with Totalize function. The measurement is armed to begin and end after pressing the MANUAL ARM hardkey. The duration of the measurement is the time between key presses.

For additional information regarding the arming of the HP 5371A, see Section 5 of the Operating and Programming Manual.

6-29. ASSEMBLY LEVEL THEORY

6-30. A1 Timebase Control Board

The main functions of the A1 Timebase Controller include the buffering detection, and selection of either the 1, 2, 5, 10 MHz external time base input (via the HP 5371A rear panel) or the internal ovenized 10811-60111 oscillator; provide overvoltage detection for both Channel A and B inputs; inform the 68000 μP of the installation and variety of the input pods that are installed in the HP 5371A; and, working in conjunction with the A1 Timebase Multiplier, generate the 500 MHz reference frequency, buffered 10 MHz rear-panel output, and the 125 MHz clock for the A5 ZDT/Count Board's Ram Write circuit.

One of two time base references provide the signal for generation of the 500 MHz reference frequency which is used in the measurement process of the counter. One source, the A15 10811-60111 ovenized high stability oscillator is mounted inside the HP 5371A. The A15 oscillator plugs into connector J5 on the A12 Motherboard. Power to the oscillator is provided by A1's "Internal Time Base Control" via a +12-volt regulator, A12U8, mounted on the A12 Motherboard. Unregulated +25V from the A12 Motherboard provides the power required by the oscillator's oven heater.

6-31. A2 Input Amplifier Board

The A2 Input Amplifier Board contains two DC coupled 500 MHz amplifier circuits, Channel A and Channel B. These circuits receive input signals from the front panel Input Pods, or the rear-panel Option 060 connectors A and B. This assembly conditions, buffers, shapes, and translates the input signals to EECL logic levels and routes them directly to the A5 ZDT/Count Board's Sequencer IC, U29.

Both input amplifier channels provide the circuitry that control the input impedance, trigger slope and trigger level, circuit termination, and overvoltage protection for the HP 5371A. The two identical amplifiers are fully programmable and designed to optimize pulse fidelity. Other functions include:

- Attenuates (8 dB) and terminates (0 or –2 Volts) input signals
- Sets trigger levels
- Measures peak amplitude of input signals by removing any DC offset. This function is microprocessor controlled.

- Comparator hysteresis window is ±4 mV. If DC-compensated input signal passes through both hysteresis points, the comparator will output two square waves, each 180° out of phase. One is routed to the A5 ZDT/Count Board to continue the counting process while the other is conditioned to drive the front-panel trigger LED.

- Provides front-end overvoltage protection There are three methods to set the trigger level of Channels A and B.

    1. Manual – Trigger levels are set by specifying the voltage. The range is ± 2 Vdc in 2 mV steps with the attenuator in the 1:1 position. In the 2.5:1 position the range is ±5 Vdc in 5 mV steps.

    2. Single Auto Trigger — The user selects the trigger level as a percentage of the input peak-to-peak signal. The instrument sets and displays the corresponding voltage level at the beginning of the measurement session. The range is 0% to 100% in 1% steps.

    3. Repetitive Auto Trigger — This is similar to Single Auto Trigger mode except that the HP 5371A sets the corresponding voltage at the beginning of each measurement block for multiple block measurements.

6-32. A4 Interpolator Board

The A4 interpolators are used to determine the small time increments, to a resolution of at least 200 ps, between the edge of the event being counted and the edge of the next 500 MHz reference clock that occurs at the opening (start) and closing (stop) of the measurement gate. The results of both interpolating measurements are combined with the main count derived in the Timing Counter to obtain the total gate time.

The A4 Interpolator Board uses a "flash interpolator" technique to measure the uncertainty introduced by the time difference between the actual input event edges and the opening and closing of counting gate. The A4 measures the fractional time difference between the leading edge of the first gated event and the next 500 MHz reference clock pulse for both the opening (Start) and closing (Stop) of the count gate. A5 Event Counters 1 and 2 store the integral number of events while the counting gate is open. The fractional time difference is measured by the A4 assembly. The Sequencer sends the "Start" latch, IT1, to the interpolator board, where it is synchronized with the 500 MHz reference clock (CLK A). A copy of this synchronized latch, CI1, is sent to the A5's Timing Counter chain to initiate the Timing Counter ZDTs count process. The value of the ZDT count at that moment is stored in its corresponding ZDT RAM. Another copy of CI1 is used for the interpolation process. The A4 circuits detect and encode the point of coincidence between the "Start" latch, IT1, and the 500 MHz reference clock, CLK A. This 4-bit binary code is sent to the A6 DMA/Gate Board and stored in the "Start" Interpolator RAM. This process repeats itself for the Sequencer's "Stop" latch, IT2. Again, IT2 is synchronized with the 500 MHz reference clock. A copy of this synchronized latch, CI2, is sent to the A5's Timing Counter chain to stop the Timing Counter ZDTs count process. The value of the ZDT count is again stored in the ZDT's corresponding RAM. The A4 assembly uses another copy of the "Stop" latch, CI2, for the interpolation process. Coincidence is detected, encoded, and sent to the A6 assembly and stored in the "Stop" Interpolator RAM.

6-33. A5 ZDT/Count Board

The A5 ZDT/Count Board does the following:

- provides the hardware that makes the continuous count process

- performs the sampling of a binary counter without disturbing the count process

- performs the above at reasonable counting rates and data rates with adequate resolution.

The two integrated circuits (ICs) that make such a measurement possible are the Sequencer and the six Zero-Dead-Time Counters. The Sequencer directs input signals (measured event clocks), and the arming and gating signals (event latches) to the appropriate ZDT IC and time latches to the A4 Interpolator Board. The ZDT's perform the actual counting of the time or events as specified by the latching signals. The counting results are stored in RAM ICs associated with each ZDT. The measurement information is accessed and sent to either the A7 Processor Board for processing and its subsequent front-panel CRT display, or the A8 IO Control Board where the unprocessed data is routed through the HP-IB interface circuitry to an external controller for processing.

6-34. A6 DMA/Gate Board

The A6 DMA/Gate Board's major function is the generation of DMA addresses and the control of writing measurement data to ZDT RAM ICs located on the A5, and timing measurement data to RAM ICs located on the A6 assembly. Two other functions include the generation of timing signals TG1 and TG2 by the System Timing Controller, and the External Amp circuit, which terminates and conditions the front-panel EXTERNAL ARM input. From here the External Arm signal is routed to the A5 Sequencer IC, U29.

6-35. A7 Processor Board

The A7 assembly is the overall controller of the HP 5371A. The HP 5371A's Processor unit is centered around the 68000 16-bit microprocessor, using a memory-mapped architecture. A 16-bit bidirectional data bus is used to control and monitor the various circuits and assemblies within the counter. The microprocessor controls the output to the front-panel CRT, reads the front-panel keypad, and setups, executes, and processes all counter measurements.

The A7 Processor interacts with the HP-IB controller on the A8 I/O Controller Board to control all communications over the HP-IB.

The A7 assembly has six 32K byte RAM ICs having a total memory space of 92K words, each 16-bits wide. The RAMs are CMOS to facilitate having a back-up battery source. When the counter is in Standby mode, with front-panel STBY-ON switch in the STBY position, a voltage line derive on the A12 assembly called LP supplies two of the six RAM ICs with back-up power. If the AC power cable is disconnected from HP 5371A or the A7 Processor is physically removed from the counter's chassis, then line LP is replaced with battery A7BT1 power. The microprocessor, through its structured interrupt system, senses any loss of power and initiates a power-down sequence. During this power-down sequence, the instrument's programmed front panel/HP-IB settings and HP-IB address are stored in the back-up RAMs. When power recovers, this programming is read from RAM during the microprocessor's power-up sequence.

Most control, data, and address communication takes place via two busses, a System Bus and a Count Hardware Bus. The system bus is used for address, data, and control signals to the A8 I/O Controller. The Count Hardware Bus is buffered from the System Bus on the Processor board. All address, data, and control signals to the measurement boards (A2, A4, A5, and A6) travel via this bus.

6-36. A8 I/O Controller Board

The A8 I/O Controller Board works with the A7 Processor Board to control the overall operation of the HP 5371A. Its main functions include:

A. Providing the interface capabilities between the 68000 μP, located on the A7 assembly, and the A17 CRT and CRT Driver Board.

B. Generating the synchronization signals required by the CRT Display Driver.

C. Generates front-panel keypad scan signals.

D. Receives and processes signals from the front-panel ENTRY/MARKER Rotary Pulse Generator (RPG).

E. Drives front-panel HP-IB STATUS LEDs DS1 through DS4 (RMT, LSN, TLK, and SRQ respectively) and INSTRUMENT CONTROL LEDs DS5 and DS6 (GATE and SINGLE respectively).

F. Controls the flow of input and output through the rear-panel HP-IB port.

G. Coordinates the DMA transfer of data between either the 68000 μP or RAM storage and the rear-panel HP-IB port.

6-37. A9 Double Regulator Board

The A9 Double Regulator uses the unregulated +25 Volts from the A12 Motherboard to generate a switching –5.2 Volts supply and a –3.3 Volt linear supply. The +25-volt unregulated input is fused at 10 Amps by A9F1. The –3.3-volt supply's input is the output of the –5.2-volt supply. The –5.2-volt supply is adjusted by potentiometer A9R14 and the –3.3-volt supply is adjusted by A9R24. Heat-sensitive posistor R36 protects against overheating of the HP 5371A due to circulating fan B1 failure. This posistor generates the HOT signal that effectively shuts down the HP 5371A circuitry. The –5.2V output supplies power to all ECL ICs and the –3.3V supplies power to the EFL ICs.

6-38. A10 Triple Regulator Board

The A10 Triple Regulator uses the unregulated +25 Volts from the A12 Motherboard to generate switching +5, +15, and –15 Volt power supplies.

6-39. A11 Front Panel Board

The front panel Numeric keypad and Control Knob (RPG) are mounted on the A11 assembly which routes all data entries to the A8 I/O Controller Board (via a flat ribbon cable) for processing. Also, there are 10 LEDs for feedback to the user.

6-40. A12 Motherboard

The A12 Motherboard provides power and signal flow paths (busses) for all printed circuit boards installed in the HP 5371A card cage. The major signals are the system data lines, measurement data lines, address lines, HP-IB lines, miscellaneous control lines, and all power distribution lines. The digital signals are divided into two different busses, the System Bus and the Count Hardware bus, to isolate the digital noise from the counting hardware. Data, address, and control lines from one bus to the other is latched through buffers located on the A7 Processor Board. The Count hardware bus can be turned off when not in use.

The A12 Motherboard also has miscellaneous circuitry such as power-up control, rear-panel signal buffering, power regulation for the A15 Oven Oscillator's oven and crystal, fan control, power failure monitoring circuits, and Option switch S1.

6-41. A13 Rear Panel Board

The A13 Rear Panel Board is equipped with six female BNC connectors that allow the user to input either a 1 MHz, 2 MHz, 5 MHz, or 10 MHz reference source and allows access to key arming and gating signals. The BNCs are configured as follows:

CONNECTOR	CONNECTOR LABELED	SPECIFICATION
A13J2	EXTERNAL INPUT	>0.5 Vp-p into 1KΩ (nominal)
A13J3	OUTPUT	>1 Vp-p into 50Ω
A13J4	GATE 1	0 to 1 V into 50Ω TTL into ≥ 10kΩ
A13J5	GATE 2	0 to 1 V into 50Ω TTL into ≥ 10kΩ
A13J6	ARM DELAY 1	0V to 1V into 50Ω TTL into ≥ 10kΩ
A13J7	ARM DELAY 2	0V to 1V into 50Ω TTL into ≥ 10kΩ

6-42. A14 Timebase Multiplier Board

The A14 Timebase Multiplier Assembly is basically a phase-lock loop with an output buffer stage that operates in conjunction with the A1 Timebase Controller to generate the 500 MHz frequency. The 1 MHz input frequency to the PLL is derived on the A1 assembly from either the internal 10 MHz oscillator or a 1, 2, 5, or 10 MHz external reference source. The PLL's loss-of-lock detection circuit is also located on the A1 assembly. In addition to the 500 MHz clock generation, the A14 Timebase Multiplier produces the rear-panel 10 MHz frequency standard and the 125 MHz ECL clock used for various count hardware functions.

When the 500 MHz Phase-Lock-Loop is operating correctly, the 500 MHz voltage controlled oscillator (VCO) is locked to the 1 MHz reference frequency — effectively multiplying it by 500. A1 derives the 1 MHz PLL input by dividing either the internal or external reference frequency by either 1, 2, 5, or 10. The result of the division is always 1 MHz. The value of the divisor is selected by successively incrementing the divisor until the A1 loss-of-lock window detector located at the A14 loop filter output detects lock. At this point, the divisor is frozen.

6-43. A15 Oven Oscillator

The A15 Oven Oscillator is an extremely stable, compact, low-power 10 MHz source. The crystal, along with the oscillator, circuit buffer, and oven control circuits are all mounted inside a thermal housing.

6-44. A17 CRT and CRT Driver Board

The CRT display unit consists of the CRT and CRT Driver Board. The Cathode Ray Tube (CRT) is a 7-inch, medium resolution unit. Menus of measurement functions, arming and input options, and other operating conditions are displayed on the CRT. Also accessible are status messages which are enhanced descriptions of instrument settings. "Help" screens assist in the configuration of the HP 5371A. After processing, measurement results can be displayed as a Histogram, Time Variation or Event Timing graph. These features assist the user with the instrument's setup and interpretation of the processed data.

6-45. HP 5371A MEASUREMENT CYCLE

In a typical measurement cycle, the HP 5371A performs the following sequence of activities:

A. At HP 5371A power-up, the A7 Processor Board's 68000 μP performs a RAM and ROM check, which is a subset of the diagnostics tests. These tests check the overall operation of the A2 Input Amplifier Board, the A5 ZDT/Count Board's ZDT counter ICs (ZDT's), the A6 DMA/Gate Board's System Gate Timer (STC), and the A7 Processor Board's software timer.

In checking the memory, a checksum is performed on the A7 Processor Board's back-up CMOS RAMs. If the checksum results prove invalid, the RAMs are initialized to a known state. If results are valid, the 68000 μP assumes that the RAM contents are correct. If back-up RAMs fail to initialize, the A7 Processor Board's Real-Time Clock initializes because the 68000 μP will assume that the back-up battery has failed and consequently the clock is not properly initialized.

B. All software "tasks" responsible for running the instrument are then initiated.

C. The first menu is drawn and then the 5371A waits for further instructions.

D. The measurement cycle is started by depressing a front-panel key or by sending a command over the HP-IB bus. If a front-panel key is depressed, a 68000 μP interrupt is generated. The microprocessor services the interrupt by fetching that key from the keyboard Controller IC located on the A8 I/O Controller Board. The microprocessor then determines and validates which key was depressed.

E. The first thing to be determined is what type of measurement is to be made. This input is made via the FUNCTION menu on the CRT Display or programmed over the Hewlett-Packard Interface Bus.

F. Next, the microprocessor sets up the variables and processes required for a specified measurement. These variables include the ones used to program the A5 ZDT/Count Board ZDT measurement counter and Sequencer ICs, and if required, the A6 DMA/Gate Board DMA circuits, System Timing IC, and Dump Mode Counter. This process determines from where the measurement variables originate, and where the measurement data will be stored.

G. The counter's hardware is set up next. The Measurement Control Word is sent to the A6 DMA/Gate Board initializing it to a known set up. One bit of the control word, ~SYSTEM INIT, is toggled (set false then true) allowing the remaining individual control word bits to program the A5 and A6 assemblies. These bits are DUMPA0, DUMPA1, DUMPA2, DUMP MODE, ~MEASURE, SINGLE WRITE, S or ~T, S and ~T, ON 10 MHZ, DISABLE L1, DISABLE L2, ~SYS INIT, and ~TOTALIZE. Note that these bits correspond to signals on A5 ZDT/Count Board and the A6 DMA/Gate Board. If the counter is set up in the Repetitive Automatic triggering and the measurement is between sample blocks, the front end is told to set up as instructed.

H. Next the ZDT's are programmed. The 13-bit control bit is sent followed by the 16-bit preset. The programming of each ZDT is dependent on the type of measurement to be made, whether it is to be in continuous or non-continuous mode, and the type of arming mode is used.

I. The same Measurement Control Word we used to initialize the DMA assembly earlier is now sent to set the board up for a specific measurement and to determine the starting measurement RAM and Interpolator RAM address. Also at this time, the required number of ZDT's required to perform this particular measurement is determined.

For example, assume you wish to make a continuous-count, single-channel frequency measurement with a sample size of ten. The microprocessor will be programmed to expect 4 bytes of data from Event Counter 1, 4 bytes from the Timing Counter, and 2 bytes from the Interpolator Rams. The microprocessor calculates the starting address using the top RAM address (F000), the programmed sample block size, and the

number of latch signals required to make the measurement. In our example, the sum of the measurements in the sample and the number latches required to perform each measurement, is subtracted from the top address of the measurement RAMs. The starting address for our example measurement would be calculated as follows:

Top Address – (Block Size + number of latches) = Starting Address

F000 (Hexadecimal) – (10 + 1) = EFEF (Hexadecimal)

As the 10 measurements proceed, the data is stored in the A5 measurement RAMs starting at address EFEF. After completion of all ten measurements, the top address (F000) is reached, generating and sending an interrupt to the microprocessor informing it that the measurement is complete.

J. At this time, the microprocessor sets up the starting ZDT measurement RAM starting address.

K. The microprocessor now determines if the raw measurement data is to be sent directly to the HP-IB (Dump Mode) or to the microprocessor for processing. If the data is to sent over the HP-IB, the Dump Mode Counter, located on the A6 DMA/Gate, is programmed to the number of ZDTs that will be dumping data.

L. Next, the DMA Address Generation counter hardware is programmed to the starting ZDT and Interpolator RAM address.

M. If the System Gate Timer, located on the A6 DMA/Gate Board, is used as it is for arming modes using time intervals, it is programmed using front panel or HP-IB inputs. It is also armed to receive the Timer Trigger signal (TTR) from the A5 Sequencer IC.

N. Next, the eight internal control registers (Start Arm, Stop Arm, Event 1 ZDT, Event 2 ZDT, Clock 1, Clock 2, and Miscellaneous) of the Sequencer are programmed with the variables set up earlier.

O. The DMA is now turned on by switching ~MEAS signal low.

P. Next, the arming mode is programmed. If the measurement is an arming mode other than automatic, the hardware is ready to begin measuring. To set the measurement mode to automatic, a bit in the Miscellaneous Control Register must be toggled.

Q. The counting begins and continues until the top RAM address is reached. At this point, the A6 DMA/Gate DMA Address counter generates a terminal count (TC). The TC is latched and used to generate a microprocessor interrupt informing it that the measurement is complete.

R. Next, the DMA Measurement Control Word is re-initialized which turns the DMA off, and stops the System Gate Timer and Sequencer. The ZDT's may or may not stop, depending on the type of measurement made.

S. Using the variables set up earlier, the raw measurement data is sent to the CRT display RAMs located on the A7 I/O Controller Board.

T. The measurement hardware is now checked for count overflow and compensated for via internal software.

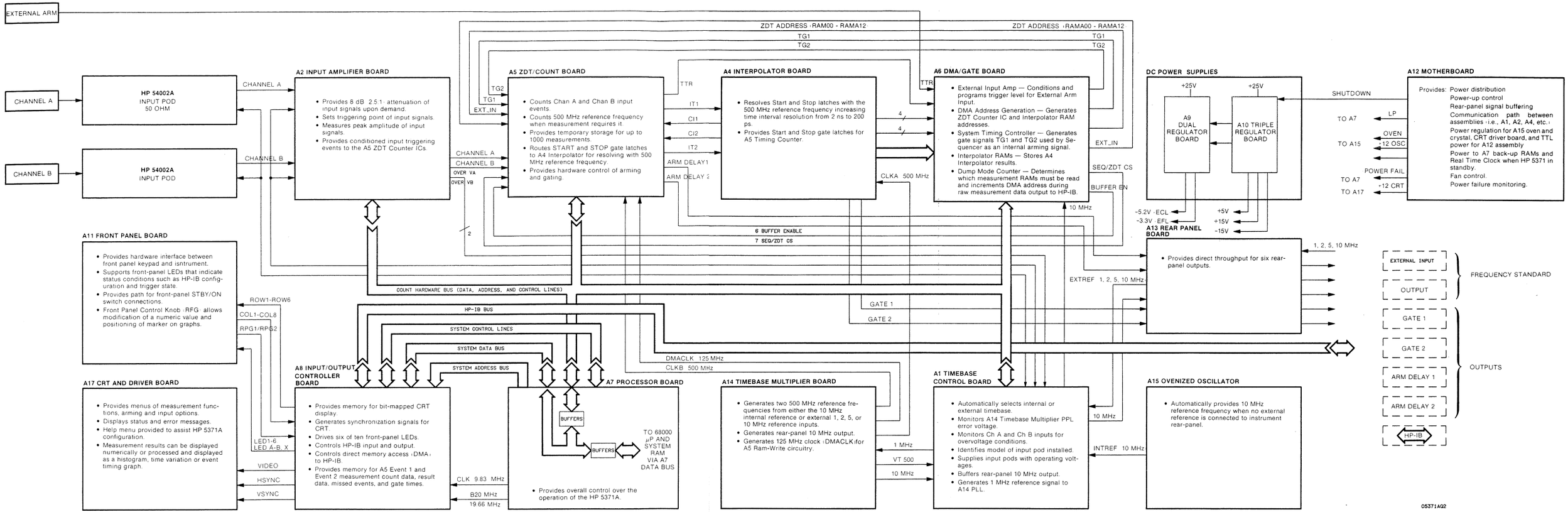


Figure 6-2. HP 5371A Conceptual Block Diagram

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