

**Read This
FIRST**

Quick Start Guide

**HP Models 6812A, 6813A, 6814B, and 6834B
AC Power Source/Analyzers**

**HP Models 6841A, 6842A and 6843A
Harmonic/Flicker Test Systems
(Normal Mode Operation)**

HP Part No. 5962-0883

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Test Software



**HEWLETT
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SAFETY NOTICE

The beginning of the User's Guide has a Safety Summary page for this instrument. Familiarize yourself with the contents of that page. The following safety precautions must be observed:

WARNING - LETHAL VOLTAGES.

Ac sources can supply 425 V peak at their output. DEATH on contact may result if the output terminals or circuits connected to the output are touched when power is applied.

Before Applying Power - Verify that the available line voltage matches that specified on the line label.

Ground the Instrument - This product is a Safety Class 1 instrument (provided with a protective earth terminal). To minimize shock hazard, the instrument chassis and cover must be connected to an electrical ground. The instrument must be connected to the ac power mains through a four-conductor power cable, with the fourth wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Fuses - On models with operator-replaceable fuses, use only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.). Do not use repaired fuses or short-circuited fuseholders. To do so could cause a shock or fire hazard.

Do Not Remove the Instrument Cover - Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.

Do Not Exceed Input Ratings - This instrument may be equipped with a line filter to reduce electromagnetic interference and must be connected to a properly grounded receptacle to minimize electric shock hazard. Operation at line voltages or frequencies in excess of those stated on the line rating label may cause leakage currents in excess of 5.0 mA peak.

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The front panel - at a glance

14-character display shows programming commands and measured values

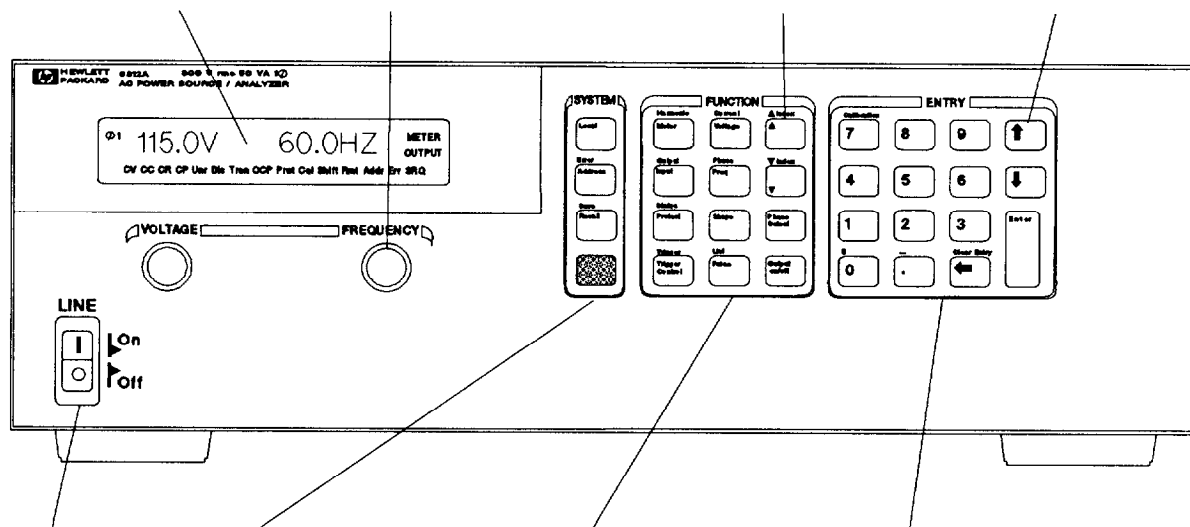
- Annunciators indicate operating modes and status conditions

Rotary pulse generators set the voltage and frequency when the ac source is in local mode

- Turn rapidly for coarse control
- Turn slowly for fine control

▲ and ▼ scroll through commands, ▲index and ▼index scroll through list and harmonic arrays

↑ and ↓ scroll through command parameters



Turns the ac source on or off

System keys:

- Return to Local mode
- Set the HP-IB address and other system parameters
- Set the RS-232 interface
- Display SCPI error codes
- Save and recall instrument configurations

Function keys:

- Enable/disable the output
- Select output phases
- Select front panel metering and harmonic analysis functions
- Program voltage, frequency, phase, current limit, pulse parameters, and waveform shapes
- Program output steps, pulses, and lists
- Select trigger control functions and generate triggers
- Set and clear protection functions
- Select output and input coupling
- Monitor status
- Scroll through command menus

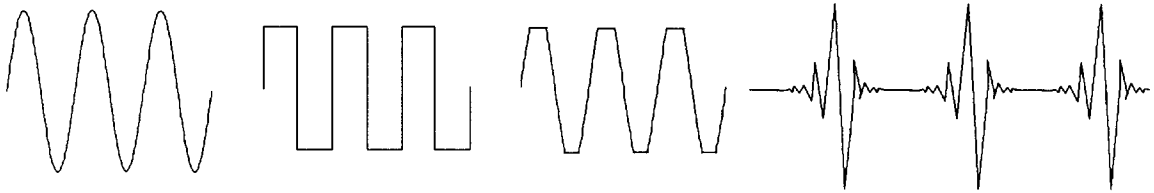
Entry keys:

- Enter values
- Increment or decrement values
- Scroll through command parameters
- Calibrate the ac source

What the ac source can do

Generate waveform shapes

- Sinewave
- Squarewave
- Clipped sinewave
- User-definable waveforms



Program the output

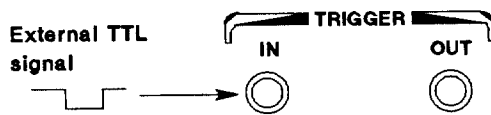
- Phase
- Ac rms voltage
- Distortion
- Frequency
- Voltage and frequency slew rates
- Rms current limit
- Dc voltage (HP 6812A/6813A/6841A/6842A only)
- Peak current limit (HP 6812A/6813A/6841A/6842A only)
- Ac coupling (HP 6812A/6813A/6841A/6842A only)
- Impedance (HP 6812A/6813A/6841A/6842A only)

Make the following measurements

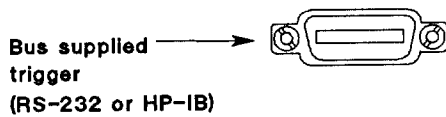
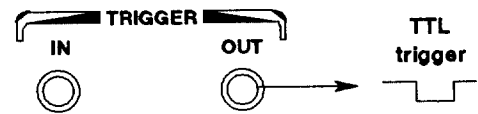
- Ac rms, dc (HP 6812A/6813A/6841A/6842A only), ac+dc rms voltage.
- Ac rms, dc (HP 6812A/6813A/6841A/6842A only), ac+dc rms current; plus repetitive and non-repetitive peak current.
- Real, reactive, and apparent power.
- Harmonic analysis of voltage and current waveforms giving amplitude, phase, and total harmonic distortion results up to the 50th harmonic.
- Triggered acquisition of digitized voltage and current with extensive post-acquisition calculations.
- Total power and neutral current measurements (HP 6834B only).

Synchronize transient events or measurements with external signals

- Triggers applied to the unit

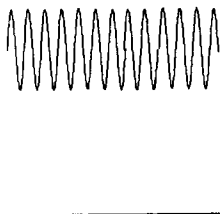


- Triggers generated by the unit

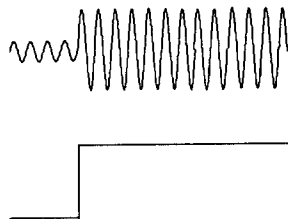


Operate in four transient modes

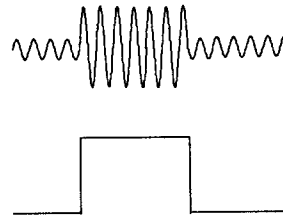
- Fixed



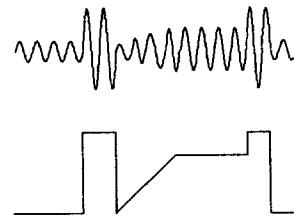
- Step



- Pulse



- List



Operate under local or remote control

- From the front panel keys
- Through the built-in HP-IB or RS-232 interfaces

Implement protection features

- Over-voltage
- Over-current
- Over-power
- Over-temperature
- User-defined external events (via a FLT shutdown signal)

How to use the front panel

Make sure the unit is turned on.

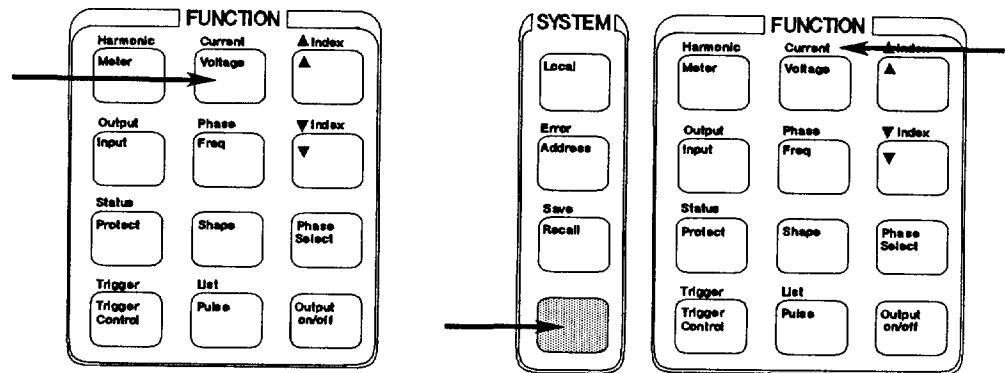
From the System key group

Local Press **Local** to activate the front panel keypad if the unit is not already in local mode. (If the Local Lockout command is in effect, cycle power to return the unit to local mode.)

From the Function key group

Voltage Press **Voltage** to select the voltage function. To select a different function, simply press the appropriate key.

To select a function appearing **above** a key (such as Current), first press the blue shift key , then press the key below the function.

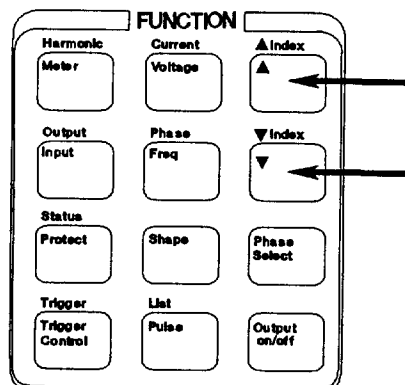


Note

Pressing **Output on/off**, **Phase Select**, or **Shift Trigger** immediately implements the function. Display annunciators indicate that an immediate action has occurred. All other function keys have command menus underneath them that are accessed via the  and  keys after the function key is pressed. The command menus are listed starting on page 14.



Use these keys to move through the command menus of the selected function.



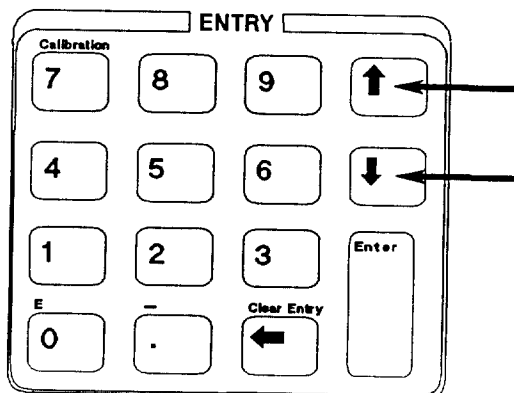
The following chart shows the commands in the **Voltage** function menu. Some commands may not appear on all models. Menus are circular, you can return to the starting position by continuously pressing  or .

Key	Display	Description
	VOLT <value>	sets immediate output voltage
	VOLT:T <value>	sets triggered output voltage
	VOLT:M FIXED	sets voltage mode
	OFFSET <value>	sets immediate dc offset voltage
	OFFSET:T <value>	sets triggered dc offset voltage
	OFFSET:M FIXED	sets dc offset voltage mode
	RANGE 150	selects the voltage range
	SLEW <value>	sets immediate voltage slew in V/s
	SLEW:T <value>	sets triggered voltage slew in V/s
	SLEW:M FIXED	sets voltage slew mode
	ALC INT	selects the voltage sense source
	ALC:DET RMS	selects the voltage sense detector

From the Entry key group



Use these keys to increment/decrement or select the command parameters to be executed. If the parameter is a number, use these keys to make minor changes to the value.  enters the selection and returns to the Meter function.



Key	Display	Description
 ,  , 	VOLT:M FIXED	sets fixed mode
	VOLT:M STEP	sets step mode
	VOLT:M PULSE	sets pulse mode
	VOLT:M LIST	sets list mode

 to 

Use the numeric Entry keys to directly enter a value for the command parameter. For example, to enter a value for the voltage parameter:

Key	Display	Description
	VOLT 0	0 volts
 , 	VOLT 60	60 volts
	60 V 60 HZ	enters the value and returns to the Meter function

Here are some basic operations

Make sure the unit is turned on. Use either the front panel keys or the corresponding SCPI commands.

The column on the left indicates the front panel keys that program the indicated action. If the SCPI programming syntax is substantially different from the front panel menu command, it is shown inside parentheses ().

The text to the right describes the result. If appropriate, the resultant output waveshape is shown underneath the description.

Enable the output

Output On/Off

When the output is enabled, the programmed voltage appears at the output and the **Dis** annunciator turns off.

Select the output phase (HP 6834B only)

Phase Select
(INST:NSEL)

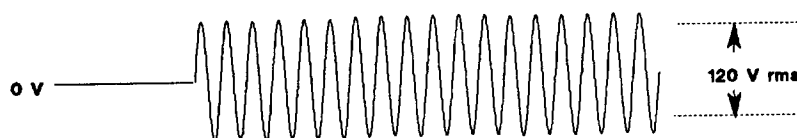
You can specify phases individually, or you can couple the phases. When phases are coupled, all three phase annunciators ($\phi 1$, $\phi 2$, $\phi 3$) on the front panel are on, indicating that commands will be sent to all three phases. Note that front panel metering is only done one phase at a time (except for the total power and neutral current measurements).

Program output functions

Set the voltage

Voltage
1
2
0
VOLT 120
Enter

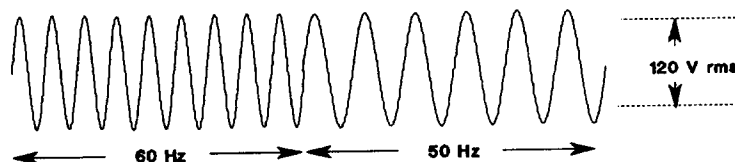
When this command is sent, the output voltage is set to 120 V rms.



Set the frequency

Freq
5
0
FREQ 50
Enter

When this command is sent, the output frequency is set to 50 Hz.

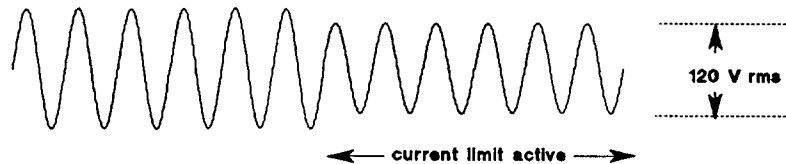


Set the rms current limit (and peak current on HP 6812A/6813A/6841A/6842A units)

Shift
Current
1
0
CURR:LEV 10
Enter

When this command is sent, the rms current limit is set to 10 A. If more current than the programmed limit is drawn, the output voltage amplitude is reduced to keep the rms current within the specified limit.

Press **Shift** **Current** **▼** to access CURR:PEAK, which lets you set the peak current limit on HP 6812A/6813A/6841A/6842A units. Note that the peak current limit circuit on these units acts instantly and clips the output voltage to maintain the programmed peak limit.



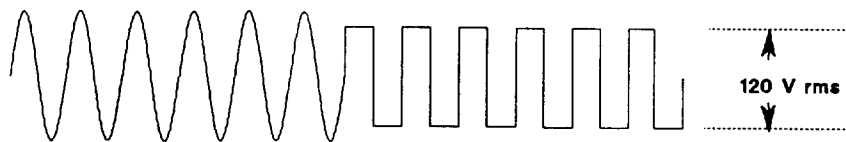
Note

The rms current limit circuit is slower than the peak current limit circuit and, depending on the setting of the peak current limit and the load on the output, your unit may generate momentary peak currents that can well exceed the rms current limit.

Select a waveshape

Shape
↑
SHAPE SQU
Enter

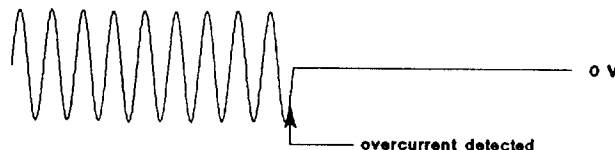
When this command is sent, the output generates a squarewave. Note that the peak-to-peak amplitude of the squarewave is less than that of a sine wave when it is programmed to the same rms voltage amplitude.



Program a protection function

Protect
PROT:CLEAR
Enter
Protect
▼
↓
CURR:PROT ON
Enter

These commands clear all previously set protection functions and then set the current protection, which disables the output when an overcurrent condition is detected. The OCP annunciator will light when this command is programmed.



Measure the output

All measurements are based on acquiring and subsequently processing output waveform information. When the ac source is on, it takes measurements and updates the front panel meter continuously. The **Meter** key accesses the measurement functions from the front panel.

The SCPI MEASure command acquires **new** waveform information each time it is executed. The SCPI FETCh command does not acquire new waveform information but extracts the desired information from previously acquired waveform data. SCPI commands let you measure phases individually or simultaneously measure all phases using the FETCh command. The following example illustrates the measurements that can be returned by the front panel of the ac source when sourcing power to a typical non-resistive load such as a power supply. The ac source output voltage and current waveforms are shown on the next page.

Note On HP 6812A/6813A/6841A/6842A units, the **Input** key selects the meter coupling and hence, what the meter will measure. The three choices are: AC only, DC only, or AC + DC.

Measurement functions

Meter (FETC/MEAS)	120V 60HZ	rms voltage and frequency
▼	120V 1.925A	rms voltage and current
▼	1.93A 60HZ	rms current and frequency
▼	120V 150.5W	rms voltage and power
▼	2.82 CREST F	current crest factor
▼	5.379A PK REP	peak current, repetitive
▼	36.83A PK NR	peak current, nonrepetitive
▼	230.6VA	apparent power
▼	175.2 VAR	reactive power
▼	0.65 PFACTOR	power factor

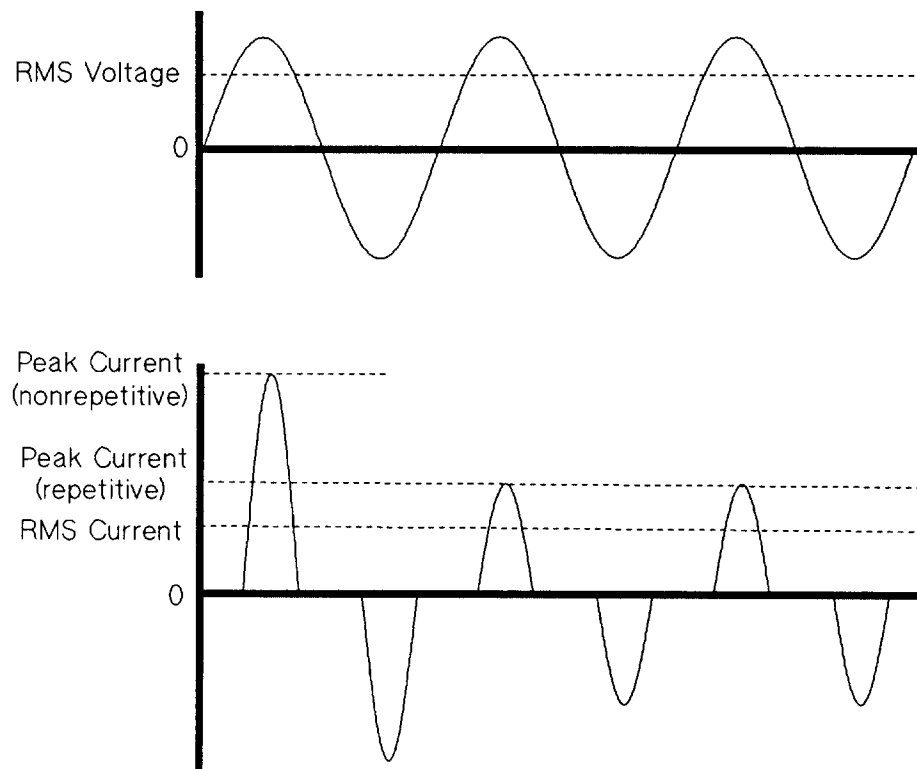
Note that in addition to the measurement functions listed above, the HP 6834B unit can also measure total power of all phases and neutral rms current.

Use the harmonic menu to make harmonic measurements of the output current. The following example illustrates the current magnitude measurements returned at harmonics 0 to 5. Note that harmonic 1 is the fundamental. Harmonic 0 is the dc component.

Harmonic measurements

Shift Harmonic (FETC/MEAS)	0.01A I:MAG:0	current magnitude at harmonic 0
Shift ▲index	1.43A I:MAG:1	current magnitude at harmonic 1
Shift ▲index	0.01A I:MAG:2	current magnitude at harmonic 2
Shift ▲index	0.91A I:MAG:3	current magnitude at harmonic 3
Shift ▲index	0.01A I:MAG:4	current magnitude at harmonic 4
Shift ▲index	0.74A I:MAG:5	current magnitude at harmonic 5

Output voltage and current waveforms



Program output transients

Up to now the ac source has been programmed with the transient system in Fixed mode. The following examples briefly describe the transient system's Step, Pulse, and List modes, which require the application of a trigger to implement the transient mode.

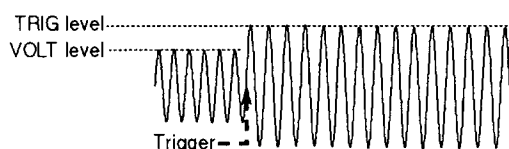
Note For the examples that follow, press **Shift** **Output**, scroll to *RST, and press **Enter** to reset the unit prior to each example. Remember to also press **Enter** to enter or activate each selection.

Program an output step

Voltage
VOLT:M STEP
VOLT 120
VOLT:T 150

Trigger Control
INIT IMMED
Shift **Trigger**

Step transients transition to a new output level upon receipt of a trigger. When these commands are sent, the voltage amplitude is stepped from its previous setting to 150 V rms upon receipt of a trigger.

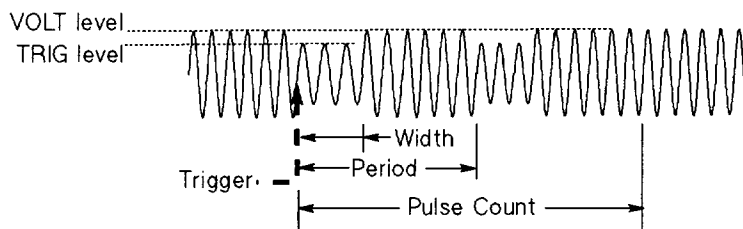


Program an output pulse

Voltage
VOLT:M PULSE
VOLT 120
VOLT:T 90
Pulse
WIDTH .01
PER .03
COUNT 2

Trigger Control
INIT IMMED
Shift **Trigger**

Pulse transients transition to a new output level upon receipt of a trigger and return to the original level after a specified time, repeating this action by the number of times specified by the count. When these commands are sent, two output pulses step the voltage amplitude from its previous setting to 90 V rms upon receipt of a trigger. At the end of the specified period (multiplied by the count), the voltage returns to its original level.

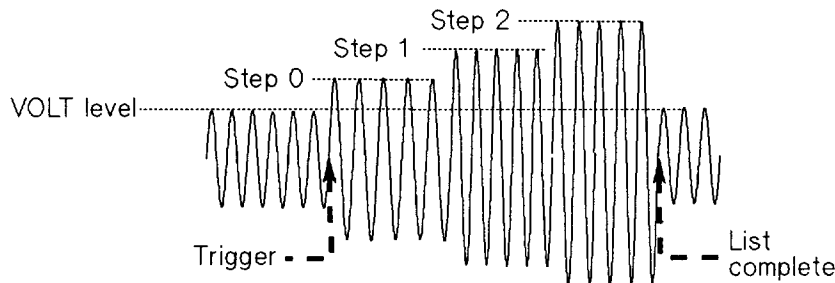


Program an output list

Voltage
VOLT:M LIST
VOLT 120
Shift **List**
DWELL [0] .5
DWELL [1] .5
DWELL [2] .5
VOLT [0] 130
VOLT [1] 140
VOLT [2] 150
STEP AUTO

Trigger Control
INIT IMMED
Shift **Trigger**

List transients generate complex output sequences. When these commands are sent, the voltage amplitude is sequentially stepped to three levels upon receipt of a trigger, and then returns to the original voltage level. The output remains at each list step for .5 seconds. The values inside the brackets ([]) are the list index references. Use **Clear Entry** to clear a list.



More transient examples

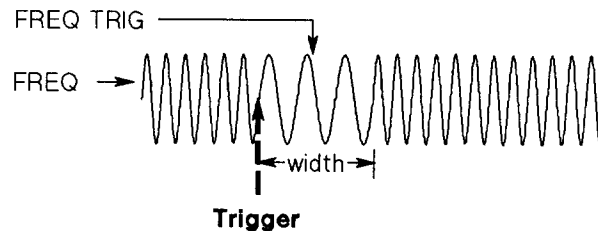
The previous examples showed how the transient system can be used to control the output voltage amplitude. The transient system can also control output frequency, phase, waveform shape, voltage and frequency slew rates, offset voltage, and peak current limit.

The following examples illustrate how the transient system's Pulse mode can generate frequency, shape, phase, and voltage slew pulses.

Freq
 FREQ:M PULSE
 FREQ 60
 FREQ:T 50

Pulse
 WIDTH .1

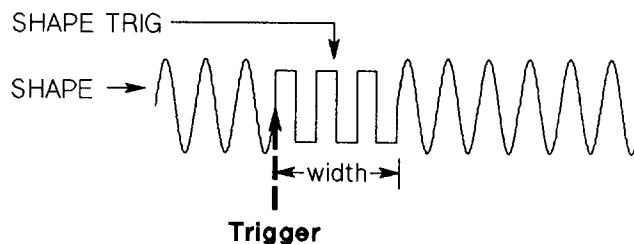
Trigger Control
 INIT IMMED
Shift **Trigger**



Shape
 SHAPE:M PULSE
 SHAPE SINE
 SHAPE:T SQUARE

Pulse
 WIDTH .05

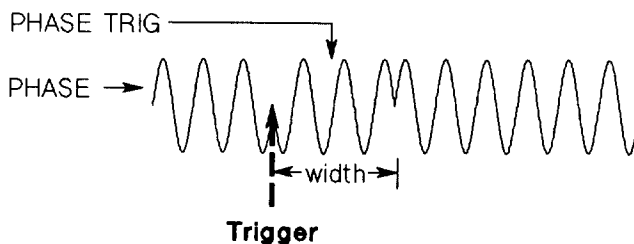
Trigger Control
 INIT IMMED
Shift **Trigger**



Shift **Phase**
 PHASE:M PULSE
 PHASE 0
 PHASE:T 180

Pulse
 WIDTH .05

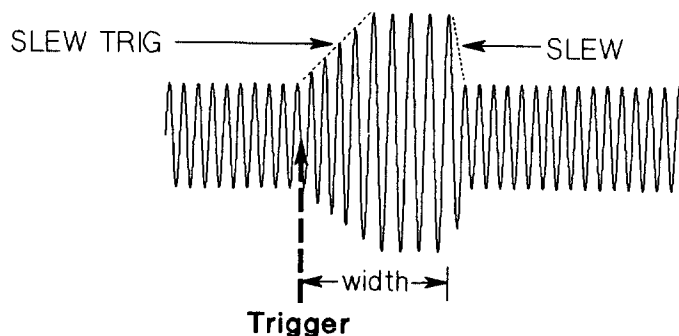
Trigger Control
 INIT IMMED
Shift **Trigger**



Voltage
 VOLT:M PULSE
 VOLT 120
 VOLT:T 150
 SLEW:M PULSE
 SLEW 10000
 SLEW:T 1000

Pulse
 WIDTH .1

Trigger Control
 INIT IMMED
Shift **Trigger**



Program trigger synchronization and delays

The previous transient examples were programmed to respond to immediate triggers. However, delayed and phase synchronized triggers can also be programmed as shown in the following examples.

No delay; no phase synchronization

Voltage When these commands are sent, the voltage amplitude changes immediately upon receipt of a trigger.

VOLT:M STEP

VOLT 120

VOLT:T 150

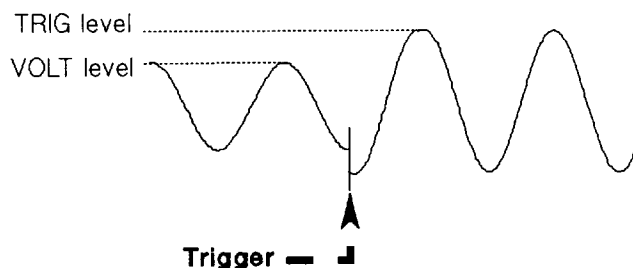
Trigger Control

DELAY 0

SYNC:SOUR IMM

INIT:IMMED

Shift Trigger



No delay; 90° phase synchronization

Voltage When these commands are sent, the voltage amplitude changes at the next 90° phase angle that occurs following the receipt of a trigger.

VOLT:M STEP

VOLT 120

VOLT:T 150

Trigger Control

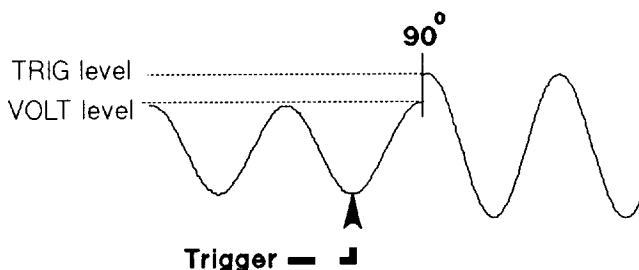
DELAY 0

SYNC:SOUR PHAS

SYNC:PHAS 90

INIT:IMMED

Shift Trigger



Trigger delay; no phase synchronization

Voltage When these commands are sent, the voltage amplitude changes .0167 seconds after the receipt of a trigger.

VOLT:M STEP

VOLT 120

VOLT:T 150

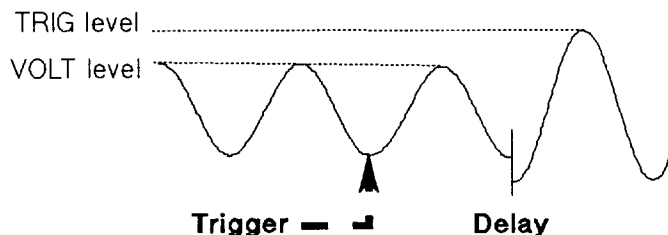
Trigger Control

DELAY .0167

SYNC:SOUR IMM

INIT:IMMED

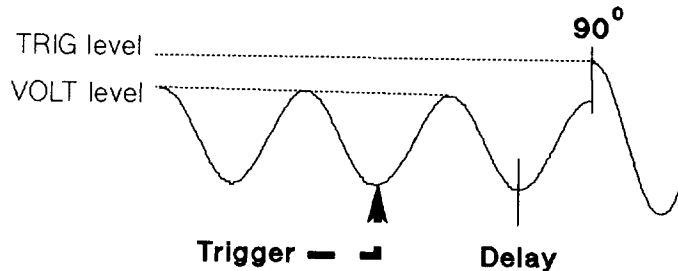
Shift Trigger



Trigger delay; 90° phase synchronization

Voltage
VOLT:M STEP
VOLT 120
VOLT:T 150
Trigger Control
DELAY .0167
SYNC:SOUR PHAS
SYNC:PHAS 90
INIT:IMMED
Shift Trigger

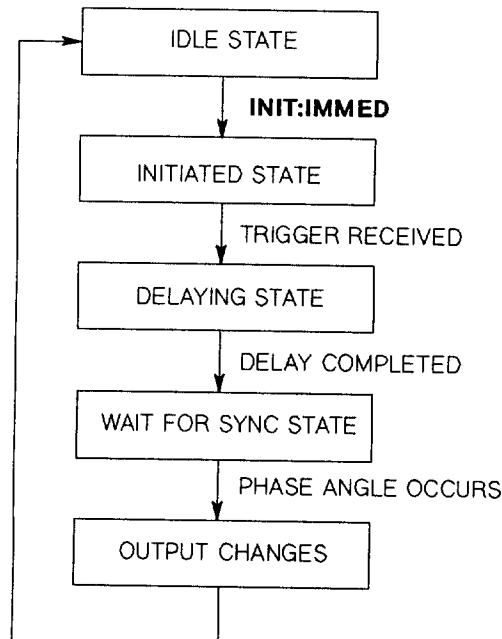
When these commands are sent, the voltage amplitude changes at the next 90° phase angle that occurs after the .0167 second delay has expired, following the receipt of a trigger.



More about the trigger system

In the previous examples, a front panel trigger is used to generate the output transients. The trigger is shown occurring at 270° but actual triggers may occur at any phase. Delay and phase synchronization however, will occur as programmed.

Note that trigger system used in the ac source provides great flexibility in generating triggers. The following figure is a simplified model of the trigger system. A complete discussion of the capabilities of the trigger system is beyond the scope of this Quick Start Guide. Refer to the ac source Programming Guide for further details.



The front panel menus - at a glance

SYSTEM Keys

Local

Press to change the ac source's selected interface from remote operation to local (front panel) operation. Pressing this key has no effect if the interface state is already Local, Local-with-Lockout, or Remote-with-Lockout.

Error

Address

Error Functions

ERROR<value> Displays the system error codes stored in the SCPI error queue. If no errors exist, a 0 is displayed. The Err annunciator is lit when there are errors.

Address Functions

ADDRESS <value>	Set HP-IB address
INTF HPIB RS232	Set interface
BAUDRATE 300 600 1200	Set baud rate
2400 4800 9600	
PARITY NONE EVEN ODD	Set parity
LANG SCPI E9012	Set language
NOUTPUTS 1 3	Select number of output phases (1)

Save

Recall

Save Functions

Press to save an existing ac source state in nonvolatile memory. Up to 16 states can be saved (0-15).

Recall Functions

Press to place the ac source into a previously saved state. Up to 16 states can be recalled (0-15).

First press and release this blue shift key to select a SHIFT function. The Shift annunciator lights when this key is pressed.

FUNCTION Keys

Harmonic

Meter

Harmonic Functions

<reading>A I:MAG: <index>	Current harmonic magnitude
<reading> ° I:PHASE: <index>	Current harmonic phase
<reading>V V:MAG: <index>	Voltage harmonic magnitude
<reading> ° V:PHASE: <index>	Voltage harmonic phase
<reading>A N:MAG: <index>	Neutral current harmonic magnitude
<reading> ° N:PHASE: <index>	Neutral current harmonic phase
<reading> CURR: THD	Current total % harmonic distortion
<reading> VOLT: THD	Voltage total % harmonic distortion

Meter Functions

<reading>V	<reading>Hz	rms voltage & frequency
<reading>V	<reading>A	rms voltage & rms current
<reading>A	<reading>Hz	rms current & frequency
<reading>V	<reading>W	rms voltage & power
<reading>	CREST F	Current crest factor
<reading>A	PK REP	Peak current, repetitive
<reading>A	PK NR	Peak current, non repetitive
<reading>VA		Apparent power
<reading>	VAR	Reactive power
<reading>W	TOTAL	Total power all phases (1)
<reading>	PFACTOR	Power factor
<reading>A	NEUTRAL	Neutral rms current (1)

Trigger

Trigger Control

Trigger Function

Pressing the Shift **Trigger** key generates an immediate trigger.

Trigger Control Functions

INIT:IMMED	Initiate trigger immediately
INIT:CONT ON OFF	Initiate trigger continuously
TRIG:SOUR BUS EXT IMM	Set trigger source
DELAY <value>	Set trigger delay
ABORT	Abort all trigger sequences
SYNC:SOUR PHASE IMM	Set synchronous source
SYNC:PHAS <value>	Set synchronous phase reference

FUNCTION Keys

Status

Protect

Status Functions	
*CLS	Execute *CLS command
STATUS:PRESET	Execute STATUS:PRESET command
*ESR? <value>	Return Event Status register
*STB <value>	Return Status Byte Register
OPER:EVEN? <value>	Return STAT:OPER:EVENT?
OPER:COND <value>	Return STAT:OPER:COND?
QUES:EVEN? <value>	Return STAT:QUES:EVENT?
QUES:COND <value>	Return STAT:QUES:COND?
Protect Functions	
PROT:CLEAR	Clear latched protection
CURR:PROT ON OFF	Set over-current protection
VOLT:PROT ON OFF	Set over-voltage protection (3)
VOLT:PROT <value>	Set over-voltage protection level
DELAY <value>	Set time delay for activating protection fault

Output

Input

Output Functions	
OUTP:COUP AC DC	Set output coupling (3)
*RST	Execute *RST command
TTLT:SOUR BOT EOT LIST	Set Trigger Out source
TTLT:STATE ON OFF	Set Trigger Out state
IMP:STATE ON OFF	Set output impedance programming (3)
IMP:REAL <value>	Set real part of output impedance (3)
IMP:REAC <value>	Set reactive part of output impedance (3)
PON:STATE RST RCLO	Select power-on state
RI LATCHING LIVE OFF	Set remote inhibit mode
DFI ON OFF	Set DFI state
DFI:SOUR QUES OPER	Set DFI source
ESB RQS OFF	
Input Functions	
INP:COUP AC DC ACDC	Meter coupling
CURR:RANGE HIGH LOW	Current measurement range (3)
WINDOW KBESSEL RECT	Select harmonic measurement window

Current

Voltage

Current Functions	
CURR:LEV <value>	Set output rms current limit (4)
CURR:PEAK <value>	Set immediate peak current limit (3)
CURR:PEAK:T <value>	Set triggered peak current limit (3)
CURR:PEAK:M FIXED STEP	Set peak current limit mode (3)
PULSE LIST	

FUNCTION Keys

Voltage Functions

VOLT <value>	Set AC output voltage (4)
VOLT:T <value>	Set triggered voltage (4)
VOLT:M FIXED STEP	Set voltage mode (4)
PULSE LIST	
RANGE 150 300	Set voltage range (2, 4)
OFFSET <value>	Set dc offset voltage (3)
OFFSET:T <value>	Set triggered dc offset voltage (3)
OFFSET:M FIXED STEP	Set dc offset voltage mode (3)
PULSE LIST	
SLEW <value>	Set voltage slew in V/Sec (4)
SLEW:T <value>	Set triggered voltage slew (4)
SLEW:M FIXED STEP	Set voltage slew mode (4)
PULSE LIST	
OFF:SLW <value>	Set immediate DC offset voltage slew V/Sec (3)
OFF:SLW:T <value>	Set triggered DC offset voltage slew (3)
OFF:SLW:M FIXED STEP	Set DC offset voltage slew mode (3)
PULSE LIST	
ALC INT EXT	Set voltage sense source
ALC:DET RTIME RMS	Set voltage sense detector (3)

Shape

Shape Functions		
SHAPE	SINE SQUARE	Set immediate shape
	CSIN <user>	
SHAPE:T	SINE SQUARE	Set triggered shape
	CSIN <user>	
SHAPE:M	FIXED STEP	Set shape mode
	PULSE LIST	
CLIP <value>		Set clipping level

List

Pulse

List Functions	
COUNT <value>	List repeat count
DWEL: <index><value>	Dwell list
FREQ: <index><value>	Frequency list
FSLW: <index><value>	Frequency slew rate list
IPK: <index><value>	Peak current limit list (3)
OFFS: <index><value>	DC voltage list (3)
OSLW: <index><value>	DC offset voltage slew rate list (3)
PHASE: <index><value>	Phase list(4)
SHAP: <index> SINE SQUARE	List of shapes
CSIN <user>	
STEP ONCE AUTO	Set response of list to triggers
TTLT: <index> ON OFF	Trigger Out pulse list
VOLT: <index><value>	AC voltage list (4)
VSLW: <index><value>	Voltage slew rate list (4)
Pulse Functions	
WIDTH <value>	Set pulse width
COUNT <value>	Set number of output pulses
DCYCLE <value>	Set pulse duty cycle
PER <value>	Set pulse period count
HOLD WIDTH DCYCLE	Set parameter held constant

FUNCTION Keys

**Output
on/off**

This key toggles the Output on and off. When off, the source output is disabled and the **Dis** annunciator is on.

Phase

Freq

Phase Functions

PHASE <value> Set output phase (4)
 PHASE:T <value> Set triggered phase (4)
 PHASE:M FIXED | STEP Set phase mode (4)
 PULSE | LIST

Frequency Functions

FREQ <value> Set output frequency
 FREQ:T <value> Set triggered output frequency
 FREQ:M FIXED | STEP Set frequency mode
 PULSE | LIST
 SLEW <value> Set frequency slew in Hz/sec
 SLEW:T <value> Set triggered frequency slew
 SLEW:M FIXED | STEP Set frequency slew mode
 PULSE | LIST

▼ **Index**

▲ **Index**

▼▲ Index Functions

These are Shift Index keys which are used to scroll through indexed functions. Press these keys to step through integers 0-50 for a harmonic list, or 0-99 for list points. Holding these keys down lets you rapidly scroll to any harmonic or list point.

▼▲ Functions

These keys let you move through the choices in a command list. Command lists are circular, you can return to the starting position by pressing either key.

**Phase
Select**

This key applies to 3-phase ac sources only. Pressing this key successively selects phase one first, then phase two, then phase three, and then all three phases.

ENTRY Keys



These keys let you scroll through different choices in a parameter list that apply to a specific function. If the function command has a numeric range, these keys automatically increment or decrement the existing value.



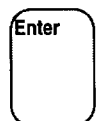
through



The numeric keys 0 through 9 are used to enter numeric values.



Press Shift and this key to enter a minus.
 Press this key alone to enter a decimal point.



Until you press the Enter key, the values or parameters you enter with the other Entry keys are displayed but not entered into the ac source.



Press Shift and this key to enter an exponent.

Clear Entry



Press Shift and this key to abort a keypad entry and clear the value. When editing a list, pressing Clear Entry truncates or clears the list at the presently displayed list point. Press this key alone to backspace and delete the last digit entered.

Calibration



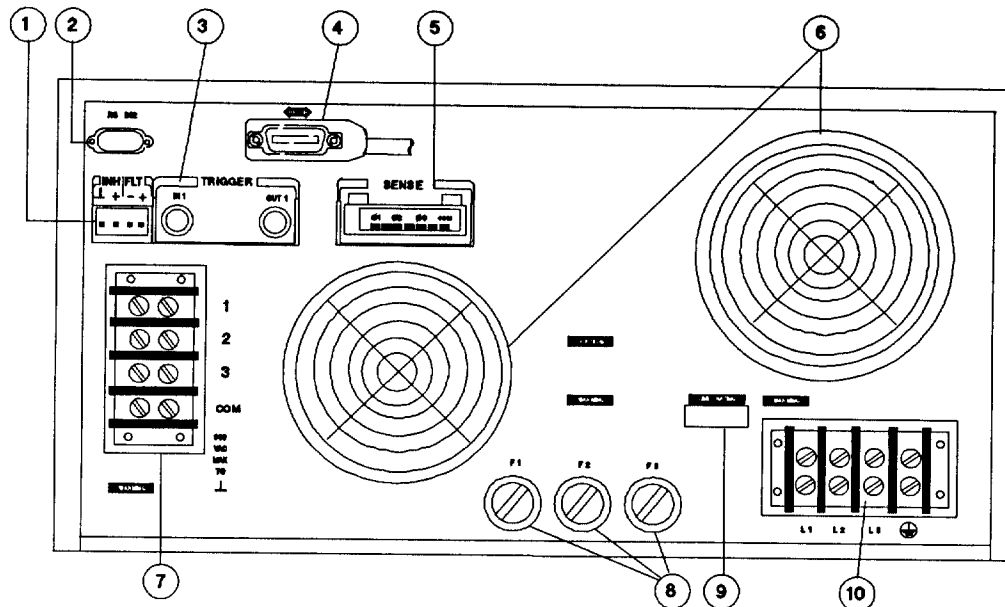
Press Shift and this key to access the calibration menu. Refer to appendix B in the User's Guide for more information.

Notes:

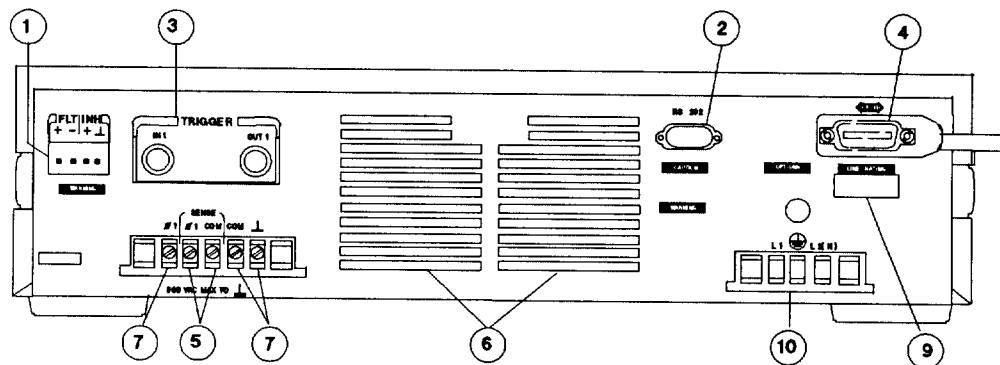
- (1) Valid for Model HP 6834B only.
- (2) Valid for Models HP 6814B/6834B/6843A only.
- (3) Valid for Models HP 6812A/6813A/6841A/6842A only.
- (4) Phase selectable on HP 6834B.

The rear panel - at a glance

HP Models 6814B 6834B 6843A



HP Models 6812A 6813A 6841A 6842A



Rear Panel Connections (See chapter 2 in the "User's Guide" for details)

1	INH (Remote Inhibit) TTL input signal for externally disabling the ac source. FLT (Discrete Fault Indicator) TTL output signal when there is a device fault.
2	RS-232 connector for remote controller.
3	TRIGGER BNC connectors for external trigger inputs and ac source trigger outputs.
4	HP-IB connector and HP-IB cable for remote controller.
5	SENSE connections for remote voltage sensing at the load.
6	Airflow Vents (do not block).
7	OUTPUT power connections to the load. ($\phi 2$, $\phi 3$ connections available on HP 6834B only.)
8	AC Input Line Fuses (HP 6814B/6834B/6843A only. Other models have internal fuses).
9	LINE RATING label specifies power source required by the ac source.
10	AC Line Input connections from the power source.



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