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HSP-2 Operational Command Items

System Command Item	Command	n = Selection	Factory
Make A Connection	* n n	Connect HSP-2 to extension n n	N/A
Break the Current Connections	* #	Terminate all connections that the HSP-2 is currently participating in.	N/A
Attention Command	* * *	ACU-1000 responds by identifying the extension number of the HSP-2 module being queried	N/A
Report Connections	* 3 0	Voice Prompts list all current connections	N/A
Disconnect Another Extension	* 3 3 n n	Terminate all connections that extension n n is currently participating in.	N/A
Monitor Function	* 3 4 n n	n n = Extension to be monitored. * 3 4 n n toggles between Monitor On and Monitor Off	Monitor Off
Store Connections	* 3 6	Store the current connection configuration for automatic recall at power-up.	None Stored
Regain Control	* 3 7	Regain system-programming control from a connected Console Program.	N/A
Data/Command Mode	* 8 0	Toggles between Data Mode and Command Mode.	Command Mode
System Reset	* 9 0 n n	If n n is any series of digits other than 00, the System Reset feature is enabled, and "n n" is the system reset code. If n n is 00, the feature is disabled.	Disabled

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Interface Module Operational Commands

Command Item	Command	Description	Factory Default
Make A Connection	* n n	Connect the module to extension n n	No Connections
Break the Current Connections	* #	Terminate all connections that the module is currently participating in.	N/A
Attention Command	* * *	ACU responds with the extension number of the module being queried.	N/A
Monitor Function	* 3 4 n n	n n = Extension to be monitored. * 3 4 n n toggles between Monitor Mode and Normal. (non-monitoring) Mode.	Disabled (Normal Mode)
Data /Command Mode	* 8 0	Toggles between Data Mode and Command Modes. Module must be connected before using.	Command Mode
System Reset	* 9 0 n n	Performs system reset. "n n" is system reset code set via HSP-2 keypad	Feature Disabled

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ACU-1000 Configuration Programming Items

System Programming	Command	n = Selection	Factory
Enter Programming Mode	* 9 9	N/A	N/A
ACU Controller Override	* 3 7	N/A	N/A
Select Module to Program	* 0 1 n n	n n = slot extension (two digits must be entered)	N/A
Exit Programming Mode	* #	N/A	N/A
Reset Modules to Factory Settings	* 9 9 9 9	N/A	N/A
Enable System PIN Numbers & Mode	* 2 9 n	0 = Disable PINs, 1 = Enable PINs in *Priority* operation, 2 = Enable PINs in *Exclusive* operation	Disabled
Program PIN Number Database	* 3 0 nnnnx	nnnn is the four digit PIN, x is the security level from 0 to 9, 0 = not secure (PIN not required), 1=least secure, 9 = most secure	PIN Database Cleared
Delete PINs	* 3 1 nnnn	nnnn is the four digit PIN	N/A
RDI-1 Programming	**Command**	**n = Selection**	**Factory**
Receive Level	* 0 2 n	0 = 12dBm, 1 = 8dBm, 2 = 4dBm, 3 = 0dBm, 4 = -4dBm, 5 = -8dBm, 6 = -12dBm, 7 = -16dBm, 8 = -20dBm, 9 = -26 dBm	0dBm
Transmit Level	* 0 3 n	0 = -26dBm, 1 = -20dBm, 2 = -16dBm, 3 = -12dBm, 4 = -8dBm, 5 = -4dBm, 6 = 0dBm, 7 = 4dBm, 8 = 8dBm, 9 = 12dBm	0dBm
COR Polarity	* 0 4 n	0 = Active Low, 1 = Active High	Active Low
Full/Half Duplex	* 0 8 n	0 = Full, 1 = Half	Half
DTMF Mute Timer	* 0 9 n	0 = Off, 1 = 0.5 sec, 2 = 1 sec, 3 = 1.5 sec, 4 = 2 sec, 5 = 2.5 sec, 6 = 3 sec, 7 = 3.5 sec, 8 = 4 sec, 9 = 4.5 seconds	Off
COR Sampling Enable/Disable	* 1 8 n	0 = Disabled, 1 = Enabled	Disabled
COR Sampling Initial Delay Time	* 1 9 n	0 = 2 sec, 1 = 4 sec, 2 = 6 sec, 3 = 8 sec, 4 = 10 sec, 5 = 12 sec, 6 = 14 sec, 7 = 16 sec, 8 = 18 sec, 9 = 20 seconds	10 seconds
COR Sampling Interval	* 2 0 n	0 = 1 sec, 1 = 2 sec, 2 = 3 sec, 3 = 4 sec, 4 = 5 sec, 5 = 6 sec, 6 = 7 sec, 7 = 8 sec, 8 = 9 sec, 9 = 10 seconds	5 seconds
COR Sampling Window Width	* 2 1 n	0 = 50 ms, 1 = 100 ms, 2 = 150 ms, 3 = 200 ms, 4 = 250 ms, 5 = 300 ms, 6 = 350 ms, 7 = 400 ms, 8 = 450 ms, 9 = 500 ms	150 ms
COR Inhibit Time after PTT	* 2 6 n	0 = None, 1 = 100 ms, 2 = 200 ms, 3 = 400 ms, 4 = 800 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	100 ms
PTT or COR Priority (Half Duplex only)	* 2 7 n	0 = COR Priority, 1 = PTT Priority.	PTT Priority
Module Security Level	* 3 2 n	0 = Not Secure, 1 = Least Secure, 9 = Most Secure	Not Secure
DTMF Enable	* 3 8 n	0 = Disabled, 1 = Enabled	Enabled
Voice Prompt Initiation Delay	* 4 4 n	0 = No Delay, 1 = 50 ms, 2 = 100 ms, 3 = 500 ms, 4 = 750 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	100 ms

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ACU-1000 Configuration Programming Items

DSP-1 Programming	Command	n = Selection	Factory
Receive Level	* 0 2 n	0 = 12dBm, 1 = 8dBm, 2 = 4dBm, 3 = 0dBm, 4 = -4dBm, 5 = -8dBm, 6 = -12dBm, 7 = -16dBm, 8 = -20dBm, 9 = -26dBm	0dBm
Transmit Level	* 0 3 n	0 = -26dBm, 1 = -20dBm, 2 = -16dBm, 3 = -12dBm, 4 = -8dBm, 5 = -4dBm, 6 = 0dBm, 7 = 4dBm, 8 = 8dBm, 9 = 12dBm	0dBm
COR Polarity	* 0 4 n	0 = Active Low, 1 = Active High	Active Low
Full/Half Duplex	* 0 8 n	0 = Full, 1 = Half	Half
DTMF Mute Timer Value	* 0 9 n	0 = Off, 1 = 0.5 Sec, 2 = 1 Sec, 3 = 1.5 sec, 4 = 2 sec, 5 = 2.5 sec, 6 = 3 sec, 7 = 3.5 s, 8 = 4 s, 9 = 4.5 sec	Off
Audio Delay H/W COR Mode	* 1 0 n	0 = 20 ms, 1 = 60 ms, 2 = 100 ms, 3 = 140 ms, 4 = 180 ms, 5 = 220 ms, 6 = 260 ms, 7 = 300 ms	20 ms
RX Audio Delay (VOX)	* 1 0 n	0 = 20 ms, 1 = 60 ms, 2 = 100 ms, 3 = 140 ms, 4 = 180 ms, 5 = 220 ms, 6 = 260 ms, 7 = 300 ms	60 ms
RX Audio Delay (VMR)	* 1 0 n	Less than 220 ms not allowed. 0,1,2,3,4,5 = 220 ms, 6 = 260 ms, 7 = 300 ms	220 ms
VMR/VOX Threshold	* 1 1 n	0 = Low (Highest Sensitivity), 1 = Med1, 2 = Med2, 3 = High (Lowest Sensitivity), 9 = Reserved for special application – do not use	Med1
VOX Hang Time	* 1 2 n	0 = 175 ms, 1 = 375 ms, 2 = 575 ms, 3 = 775 ms, 4 = 975 ms, 5 = 1.175 sec, 6 = 1.375 sec, 7 = 1.575 seconds	775 ms
VMR Hang Time	* 1 2 n	Less than 775 not allowed, 1, 2, 3 = 775 ms, 4 = 975 ms, 5 = 1.175 sec, 6 = 1.375 sec, 7 = 1.575 seconds	775 ms
COR (squelch) Type	* 1 4 n	0 = COR, 1 = VMR, 2 = Reserved, 3 = VOX	VOX
COR Sampling On/Off	* 1 8 n	0 = Disabled, 1 = Enabled	Disabled
COR Sampling Initial Delay Time	* 1 9 n	0 = 2 sec, 1 = 4 sec, 2 = 6 sec, 3 = 8 sec, 4 = 10 sec, 5 = 12 sec, 6 = 14 sec, 7 = 16 sec, 8 = 18 sec, 9 = 20 seconds	10 sec
COR Sampling Interval	* 2 0 n	0 = 1 sec, 1 = 2 sec, 2 = 3 sec, 3 = 4 sec, 4 = 5 sec, 5 = 6 sec, 6 = 7 sec, 7 = 8 sec, 8 = 9 sec, 9 = 10 seconds	5 sec
COR Sampling Window Width	* 2 1 n	0 = 50 ms, 1 = 100 ms, 2 = 150 ms, 3 = 200 ms, 4 = 250 ms, 5 = 300 ms, 6 = 350 ms, 7 = 400 ms, 8 = 450 ms, 9 = 500 ms	150 ms
Noise Reduction Value	* 2 2 n	0 = Off, 1 = Minimum… 9 = Maximum	Off
Audio Muted when Squelched	* 2 3 n	0 = Muted, 1 = Not Muted	Muted
Transmit Keying Tones	* 2 5 n	0 = None, 1 = 1950 Hz Continuous, 2 = EIA Keying Sequence; F1 (1950 Hz) Function Tone	None
COR Inhibit Time after PTT	* 2 6 n	0 = None, 1 = 100 ms, 2 = 200 ms, 3 = 400 ms, 4 = 800 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	100 ms
PTT or COR Priority	* 2 7 n	0 = COR Priority; 1 = PTT Priority (PTT/COR Priority applies to Half Duplex operation only)	PTT Priority
Keying Tone Amplitude	* 2 8 n	0 = -6 dB, 1 = -9 dB, 2 = -12 dB, 3 = -15 dB (Does not apply to EIA Keying Sequence)	-9 dB
Module security level	* 3 2 n	0 = Not Secure, 1 =Least Secure, 9 = Most Secure	Not Secure
DTMF Enable	* 3 8 n	0 = Disabled, 1 = Enabled	Enabled
High Frequency Equalizer	* 3 9 n	0 = Reserved, 1 = 5 dB cut, 2 = 3.5 dB cut, 3 = 2 dB cut, 4 = Flat, 5 = 2 dB boost, 6 = 3.5 dB boost, 7 = 5 dB boost, 8 and 9 = Reserved	Flat
DTMF Pre-emphasis	* 4 0 n	0 = DTMF Pre-emphasized, 1 = DTMF Not Pre-emphasized	Pre-emphasis
TX Audio Delay (was "Radio Type Selection")	* 4 3 n	0 = No Delay, 1= TX Audio Delay = 200ms, 2= TX Audio Delay = 400ms, 3= TX Audio Delay = 600ms, 4= TX Audio Delay = 800ms, 5 through 9 Reserved	No Delay
Voice Prompt Initiation Delay	* 4 4 n	0 = No Delay, 1 = 50 ms, 2 = 100 ms, 3 = 500 ms, 4 = 750 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	100 ms

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ACU-1000 Configuration Programming Items

PSTN-1 Programming	Command	n = Selection	Factory
Telephone Line Levels	* 0 2 n	0 = 0dBm, 1 = -3dBm, 2 = -6dBm, 3 = -9dBm, 4 = -12dBm, 5 = -15dBm, 6 = -18dBm, 7 = -21dBm, 8 = -24dBm	-9dBm
Telephone RX Level Boost	* 0 3 n	0 = 0 dB, 1 = 2.5 dB, 2 = 4.5 dB, 3 = 6 dB, 4= 7.4 dB, 5= 8.5 dB, 6= 9.5 dB, 7 = 10. 5 dB, 8=11.3 dB, 9 = 12 dB	6 dB
PSTN Type	* 0 5 n	0 = Normal, 1 = Satcom	Normal
PSTN Dialing Mode	* 0 6 n	0 = DTMF, 1 = Pulse	DTMF
DTMF Mute Timer	* 0 9 n	0 = Off, 1 = 0.5 sec, 2 = 1 sec, 3 = 1.5 sec, 4 = 2 sec, 5 = 2.5 sec, 6 = 3 sec, 7 = 3.5 sec, 8 = 4 sec, 9 = 4.5 seconds	Off
RX Audio Delay Time	* 1 0 n	0 = 10 ms, 1 = 22 ms, 2 = 35 ms, 3 = 47 ms, 4 = 60 ms, 5 = 72 ms, 6 = 85 ms, 7 = 97 ms	35 ms
VOX Threshold	* 1 1 n	0 = VOX Off, 1 & 2 = Low, 3 = High, 9 = VOX Off	Low
VOX Hang Time	* 1 2 n	0 = 500 ms, 1 = 1 sec, S, 2 = 1.5 sec, 3 = 2.0 seconds	1 second
Four-Wire/Two-Wire Operation	* 2 4 n	0=2-Wire, 1= 4-Wire w/hybrid, 2= 4-Wire; no hybrid 3= 4-Wire w/hybrid, AUX OUT goes high, 4=4-Wire no hybrid, AUX OUT goes high	Two-Wire
Module security level	* 3 2 n	0 = Not Secure, 1 =Least Secure, 9 = Most Secure	Not Secure
Outgoing Ring Time	* 3 7 n	0 = No ring, 1 = 30 sec, 2 = 60 sec, 3 = Continuous	30 seconds
DTMF Enable	* 3 8 n	0 = Disabled, 1 = Enabled	Enabled
Inactivity Disconnect Timer	* 4 2 n	0 = None, 1 = 30 sec, 2 = 1 min, 3 = 2 min, 4 = 5 min, 5 = 10 min, 6, 7, 8 & 9 = Reserved	2 minutes
Voice Prompt Initiation Delay	* 4 4 n	0 = No Delay, 1 = 50 ms, 2 = 100 ms, 3 = 500 ms, 4 = 750 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	No Delay
LP-1 Programming	**Command**	**n = Selection**	**Factory**
DTMF Mute Timer	* 0 9 n	0 = Off, 1 = 0.5 sec, 2 = 1 sec, 3 = 1.5 sec, 4 = 2 sec, 5 = 2.5 sec, 6 = 3 sec, 7 = 3.5 sec, 8 = 4 sec, 9 = 5 seconds	Off
RX Audio Delay Time	* 1 0 n	0 = 10 ms, 1 = 35 ms, 2 = 60 ms, 3 = 85 ms, 4 = 110 ms, 5 = 135 ms, 6 = 160 ms, 7 = 185 ms	60 ms
VOX Threshold	* 1 1 n	0 = VOX Off, 1 = Low, 2 = Med, 3 = High, 9 = Off	Med
VOX Hang Time	* 1 2 n	0 = 10 ms, 1 = 750 ms, 2 = 1.5 sec, 3 = 2.25 seconds	750 ms
Module security level	* 3 2 n	0 = Not Secure, 1 =Least Secure, 9 = Most Secure	Not Secure
Dial and Busy Tone Style	* 3 3 n	0 = USA Style, 1 – 9 = Reserved.	USA
Ring Cadence	* 3 4 n	0 = USA Style, 1 = European Style, 2 – 9 = Reserved	USA
Dial Tone Enable	* 3 5 n	0 = Dial Tone Disabled, 1 = Dial Tone Enabled	Enabled
Ringback Enable	* 3 6 n	0 = Ringback Disabled, 1 = Ringback Enabled	Enabled
Outgoing Ring Time	* 3 7 n	0 = No Outgoing Ring, 1 = 30 seconds, 2 = 60 seconds, 3 = Continuous	30 seconds
DTMF Enable	* 3 8 n	0 = DTMF Disabled, 1 = DTMF Enabled	Enabled
Voice Prompt Initiation Delay	* 4 4 n	0 = No Delay, 1 = 50 ms, 2 = 100 ms, 3 = 500 ms, 4 = 750 ms, 5 = 1 sec, 6 = 2 sec, 7 = 3 sec, 8 = 4 sec, 9 = 5 seconds	No Delay

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ACU-1000 Hardware Configuration Settings

Main Chassis Rear Panel	Designator	Factory Setting
AC Line Voltage 110V/220V AC nominal	AC Line Input Module	Set for Voltage at Customer Site
Power Supply Module	**Designator**	**Factory Setting**
DC Supply Voltage +12VDC	PSM-1 = SW2	+12VDC
	PSM-1A = N/A	+12VDC
Charger On/Off	SW3	Off
HSP-2 Module Configuration	**Designator**	**Factory Setting**
Internal/External Speaker Selection	JP-1	Internal Speaker Enabled
CPM-2 Module Configuration	**Designator**	**Factory Setting**
Serial Port Baud Rate	SW1-1, 2	9600
Remote Control Enable/Disable	SW1-3	Enabled
Serial Sync Character Requirement	SW1-4	Not required
Reserved for future use.	SW1-5	Off
Chassis Configuration (Single Chassis or place in Expanded System)	SW1-6, 7	Single Chassis
Manufacturing Test Enable/Disable	SW1-8	Disabled
Reserved for future use.	All of SW-2	Off
Reserved for future use.	All of SW-3	Off
DSP-1 Module Configuration	**Designator**	**Factory Setting**
Hi/Low Input Impedance (Low = 600 ohms)	JP1	Low (600 Ohms)
Input Balanced/Unbalanced	JP2	Balanced
RDI-1 Module Configuration	**Designator**	**Factory Setting**
RDI-1 has no hardware setting or adjustments	None	Not Applicable
PSTN-1 Module Configuration	**Designator**	**Factory Setting**
Ringer Volume	R73	Mid-Range
Tel Line 1 Tip connection to Rear Panel	JP2	Disabled
Tel Line 1 Ring connection to Rear Panel	JP1	Disabled
Tel Line 2 Tip connection to Rear Panel	JP4	Disabled
Tel Line 2 Ring connection to Rear Panel	JP3	Disabled

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ACU-1000 Installation Checklist

Installation Checklist
Reference ACU-1000 Manual

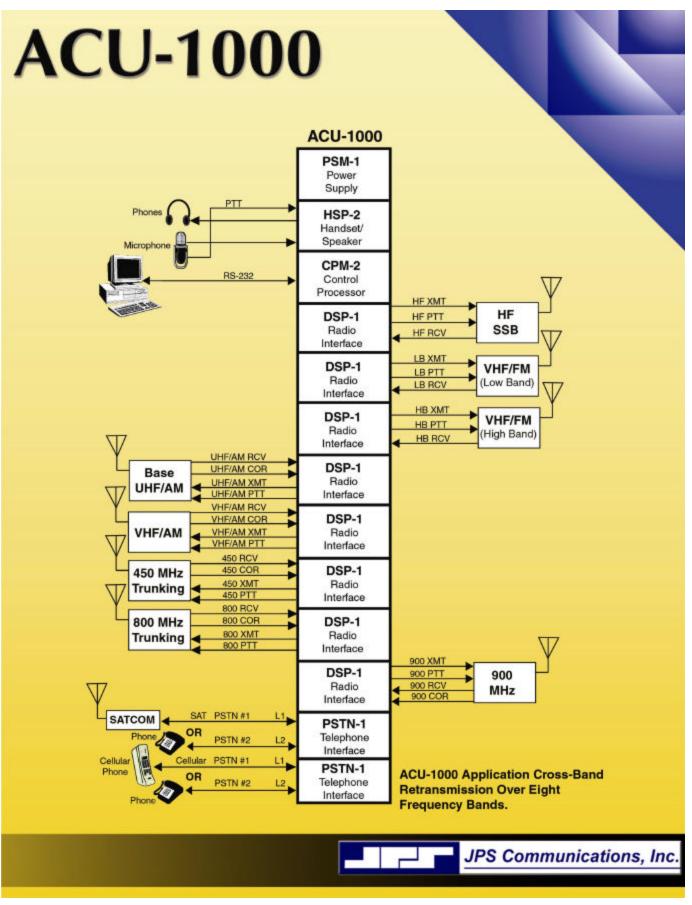|	
Provide suitable Mounting and Cooling.	See Section 2.5.
Check AC Line voltage selection.	See Section 2.6.
DC Operation needed?	See Section 2.7.
Battery Backup needed?	See Section 2.7.2 and 2.7.3.
Make Interconnections.	See Section 2.9 for External Interconnect Information.
Serial Remote Control needed?	Set Serial Remote control ON with CPM SW1-3. Set Baud Rate with CPM SW1-1 and 2.
Set Audio Input Levels if necessary.	See Programming Items for the DSP-1 and RDI-1 in Table 2-12.
Set Audio Output Levels if necessary.	See Programming Items for the DSP-1 and RDI-1 in Table 2-12.
Set COR Type and Polarity.	See Programming Items for the DSP-1 and RDI-1 in Table 2-12.
Set Squelch Type if necessary	See Programming Items for the DSP-1 in Table 2-12
Set Telephone Line Level if necessary.	See Programming Items for the PSTN-1 in Table 2-12.
Is COR Sampling needed?	See Programming Items for the DSP-1 and RDI-1 in Table 2-12.
Is Noise Reduction Needed?	See Programming Items for the DSP-1 in Table 2-12.
Are more than 12 interface modules required? (Expanded Operation).	Connect two chassis together with an Expansion Interconnect cable. Set the switches on the CPM-2 module: On Master Unit: SW1-6 On, SW1-7 Off On Slave Unit: SW1-6 On, SW1-7 On
Numerous other configuration options available but not included in this checklist. See Sections 2.10 to 2.12.	

Serial Remote Connections
CPM-2 Module (P15)

Signal	PIN
TX Data	2
RX Data	3
Ground	5

ACU-1000

ACU-1000

PSM-1 Power Supply

Phones — PTT →
Microphone →

HSP-2 Handset/Speaker

RS-232 →

CPM-2 Control Processor

DSP-1 Radio Interface
— HF XMT →
— HF PTT →
← HF RCV —
HF SSB

DSP-1 Radio Interface
— LB XMT →
— LB PTT →
← LB RCV —
VHF/FM (Low Band)

DSP-1 Radio Interface
— HB XMT →
— HB PTT →
← HB RCV —
VHF/FM (High Band)

Base UHF/AM
UHF/AM RCV →
UHF/AM COR →
UHF/AM XMT ←
UHF/AM PTT ←
DSP-1 Radio Interface

VHF/AM
VHF/AM RCV →
VHF/AM COR →
VHF/AM XMT ←
VHF/AM PTT ←
DSP-1 Radio Interface

450 MHz Trunking
450 RCV →
450 COR →
450 XMT ←
450 PTT ←
DSP-1 Radio Interface

800 MHz Trunking
800 RCV →
800 COR →
800 XMT ←
800 PTT ←
DSP-1 Radio Interface

DSP-1 Radio Interface
— 900 XMT →
— 900 PTT →
← 900 RCV —
← 900 COR —
900 MHz

SATCOM
SAT PSTN #1 L1
OR
Phone PSTN #2 L2
PSTN-1 Telephone Interface

Cellular Phone
Cellular PSTN #1 L1
OR
Phone PSTN #2 L2
PSTN-1 Telephone Interface

ACU-1000 Application Cross-Band Retransmission Over Eight Frequency Bands.

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