

CHAPTER 1
GENERAL DESCRIPTION

1-1. INTRODUCTION.

1-2. This manual contains intermediate operation instructions, maintenance instructions, and parts list for Power Housing Unit PHU-201-3, Part Number 171AS567-1 (figure 1-1).

1-3. PURPOSE OF EQUIPMENT.

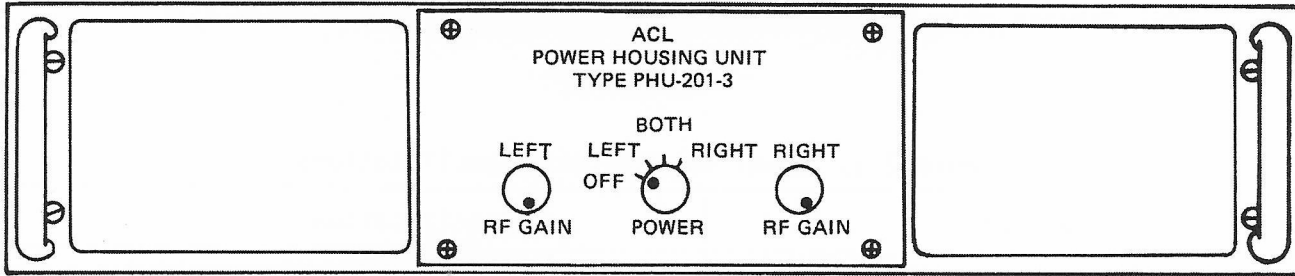
1-4. The PHU-201-3 is the housing and power supply for plug-in Radio Frequency Tuning Heads SH-205P-6, 1.0 to 2.0 GHz, PN 171AS567-2, and SH-206P-6, 2.0 to 4.0 GHz, PN 171AS567-3. Operating together, these three units comprise Radio Frequency Downconverter, PN 171AS567. The Downconverter distributes video and local oscillator outputs to selected external equipment through connectors on the PHU-201-3 rear panel.

1-5. DESCRIPTION.

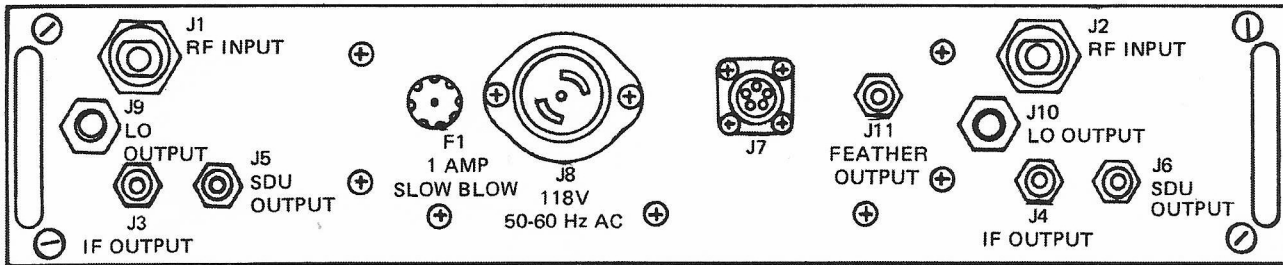
1-6. PHYSICAL. Power Housing Unit PHU-201-3 fits a standard 19-inch mounting rack. Slots on the right and left sides accommodate the plug-in Tuning Heads. Refer to table 2-1 for physical details.

1-7. FUNCTIONAL. The PHU-201-3 provides regulated +12, -12, and +24 VDC when connected to a 115 VAC source. Separate RF gain controls for each plug-in Tuning Head permit manual gain adjustment, applied to the Converter subassembly of each one. Video Amplifier VA-209 amplifies the feather input from the selected Tuning Head and routes the amplified signal to external equipment through J11, FEATHER OUTPUT.

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FRONT VIEW



REAR VIEW

Figure 1-1. Power Housing Unit PHU-201-3

CHAPTER 2
SPECIFICATIONS

2-1. INTRODUCTION.

2-2. Power Housing Unit PHU-201-3 specifications are listed in table 2-1.

Table 2-1. Power Housing Unit Specifications

Parameter	Specification
Power Supplies:	
External	115 VAC, 50-400 Hz, single-phase
Internal	+12, -12, and +24 VDC
Dimensions	3-1/2" H x 19" W x 5-1/16" D
Weight	Approximately 12 pounds
Finish	Gray enamel

CHAPTER 3

OPERATION

3-1. INTRODUCTION.

3-2. This chapter contains information on indicators, controls, and connectors, and operating procedures for PHU-201-3.

3-3. INDICATORS, CONTROLS, AND CONNECTORS.

3-4. All indicators and operating controls are located on the front panel. All connectors are located on the rear panel. Refer to figure 1-1 for front and rear panel details. Table 3-1 lists all indicators, controls, and connectors with functions and reference designations.

Table 3-1. Indicators, Controls, and Connectors

Reference Designation	Indicator, Control, or Connector	Function
F1	1 AMP SLOW BLOW (Fuse)	1 amp, slow-blow line fuse.
J1	RF INPUT (Connector)	Routes RF into PHU-201-3 to right Tuning Head.
J2	RF INPUT (Connector)	Routes RF into PHU-201-3 to left Tuning Head.
J3	IF OUTPUT (Connector)	Routes IF from right Tuning Head.
J4	IF OUTPUT (Connector)	Routes IF from left Tuning Head.
J5	SDU OUTPUT (Connector)	Routes signal from right Tuning Head to external Signal Display Unit (SDU).
J6	SDU OUTPUT (Connector)	Routes signal from left Tuning Head to external SDU.
J7	Tuning Frequency (Indicator Output Connector)	Provides DC voltage proportional to frequency of each Tuning Head.
J8	115 V 50-60 Hz AC (Power Input Connector)	Connects PHU-201-3 to power.

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Table 3-1. Indicators, Controls, and Connectors (Cont)

Reference Designation	Indicator, Control or Connector	Function
J9	LO OUTPUT (Connector)	Routes local oscillator (LO) signal from right Tuning Head.
J10	LO OUTPUT (Connector)	Routes LO signal from left Tuning Head.
J11	FEATHER OUTPUT (Connector)	Routes amplified detected RF to external equipment.
R3	RIGHT RF GAIN (Potentiometer)	Provides manual gain control for right Tuning Head over an 80-dB range.
R8	LEFT RF GAIN (Potentiometer)	Provides manual gain control for left Tuning Head over an 80-dB range.
S1	POWER (Rotary Switch)	
	OFF	Removes power from all circuits.
	LEFT	Provides power to left Tuning Head.
	BOTH	Provides power to both Tuning Heads.
	RIGHT	Provides power to right Tuning Head.

3-5. OPERATING PROCEDURE.

3-6. This procedure applies to any mode of operation.

- a. Set POWER Switch (S1) to LEFT, BOTH, or RIGHT to energize appropriate Tuning Head(s).
- b. Rotate RIGHT RF GAIN (R3) or LEFT RF GAIN (R8) Controls as necessary for operation.
- c. To deenergize PHU-201-3, turn POWER Switch (S1) to OFF.

CHAPTER 1

GENERAL DESCRIPTION

1-1. INTRODUCTION.

1-2. This manual contains intermediate operation instructions, maintenance instructions, and parts list for Tuning Head SH-205P-6, Part Number (PN) 171AS567-2 (figure 1-1).

1-3. PURPOSE OF EQUIPMENT.

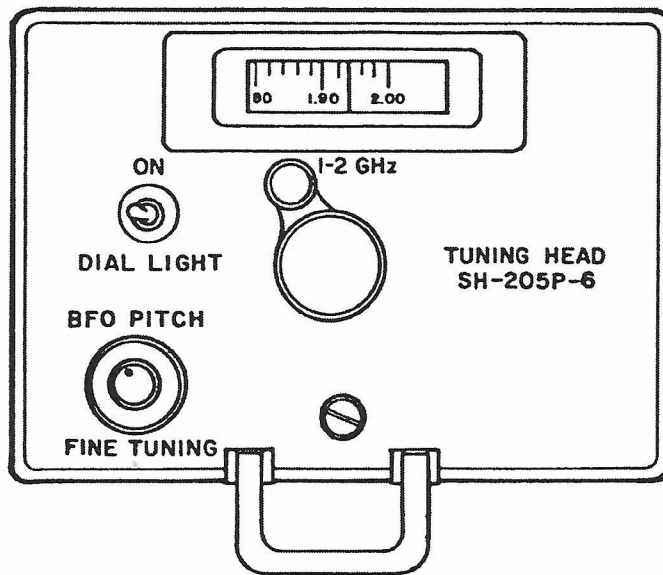
1-4. The Tuning Head is a continuously tunable solid-state unit capable of receiving and converting to 21.4 MHz IF signals from 990 to 2000 MHz. Tuning Head SH-205P-6 is mounted into the left side of Power Housing Unit PHU-201-3, PN 171AS567-1, and Tuning Head SH-206P-6, with a range of 1990-4000 MHz, is mounted into the right side of PHU-201-3. Together the three units comprise RF Downconverter, PN 171AS567.

1-5. DESCRIPTION.

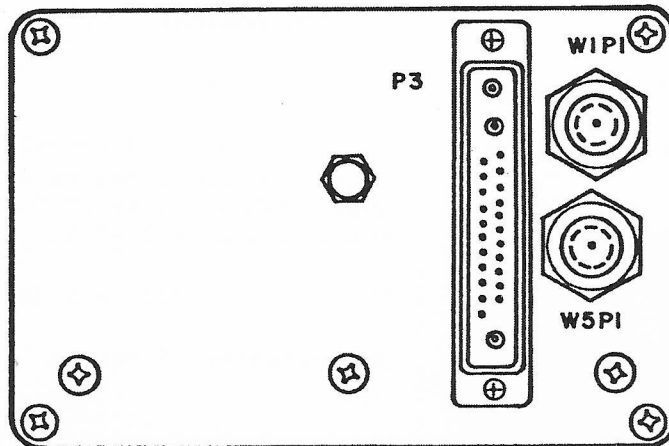
1-6. PHYSICAL. A single slotted thumbscrew secures the Tuning Head when installed. Refer to table 2-1 for physical details.

1-7. FUNCTIONAL. The Tuning Head is comprised of an RF Tuner (containing a tunable three-pole preselector, a crystal diode mixer, a local oscillator tuned to 110 MHz above RF, and a 110 MHz amplifier), a 110 to 21.4 MHz Converter (containing a 110 MHz amplifier, a mixer, a 131.4 MHz local oscillator, and a 21.4 MHz amplifier), and a Feather Amplifier, which receives detected unamplified RF from the Tuner, amplifies it, and routes it as Tuning Head output. Overall gain is approximately 60 dB.

1-8. The LEFT RF GAIN Control of PHU-201-3 applies manual gain control to the inputs of the 110 MHz and 21.4 MHz IF amplifiers of the Converter. This control voltage extends the gain control range of the receiving system for high-level signals while keeping at a minimum the noise figure for low-level signals. All inputs and outputs, with the exception of RF input and local oscillator (LO) output, are wired into the single 22-pin connector on the rear panel, which mates with a female connector in the PHU-201-3.



FRONT VIEW



REAR VIEW

Figure 1-1. Tuning Head SH-205P-6

CHAPTER 2
SPECIFICATIONS

2-1. INTRODUCTION.

2-2. Tuning Head SH-205P-6 specifications are listed in table 2-1.

Table 2-1. Tuning Head Specifications

Parameter	Specification
Frequency Range	990 to 2000 MHz
Noise Figure	14 dB maximum
RF Gain	55 dB minimum
Intermediate Frequencies	110 and 21.4 MHz
Bandwidth	4 MHz $\pm 10\%$ at 3 dB points
IF Rejection	90 dB minimum
Image Rejection	60 dB minimum
Input Impedance	50 ohms nominal
Local Oscillator Radiation	300 uV maximum
Feather Characteristics	With 600-ohm load resistance, peak RF input -20 dBm produces detected feather video output pulse of 0.3 ± 0.2 V at J11; 0 dBm produces 3 ± 2 V.
Dimensions	3-1/3" H x 4-3/4" W x 14" D
Weight	Approximately 5 pounds

CHAPTER 3

OPERATION

3-1. INTRODUCTION.

3-2. This chapter contains information for operation, indicators, controls, and connectors for Tuning Head SH-205P-6.

3-3. OPERATING PROCEDURE.

3-4. For operating procedures, refer to the appropriate Power Housing Unit technical manual.

3-5. INDICATORS, CONTROLS, AND CONNECTORS.

3-6. All operating controls are located on the front panel. All connectors are located on the rear panel. Refer to figure 1-1 for front and rear panel details. Table 3-1 lists controls, indicators, and connectors with functions and reference designations.

Table 3-1. Indicators, Controls, and Connectors

Reference Designation	Indicator, Control, or Connector	Function
DS1	Dial Light	
	ON	Indicates that Tuning Head circuits are energized.
	Off	Indicates that Tuning Head circuits are deenergized.
P3	Connector	A 22-pin connector that routes all inputs and outputs except as noted below.
R1	FINE TUNING (Potentiometer)	Has a range of 50 kHz, and is tuned to center the IF within the passband.
R2	BFO PITCH (Potentiometer)	Has a range of 20 kHz, can be varied to provide an aural null during continuous wave (CW) operation.
S1	DIAL LIGHT (Toggle Switch)	
	ON	Energizes dial light.
	Off	Deenergizes dial light.

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Table 3-1. Indicators, Controls, and Connectors (Cont)

Reference Designation	Indicator, Control, or Connector	Function
W1P1	BNC Connector	Routes RF into Tuning Head from external equipment.
W5P1	BNC Connector Tape Dial and Tuning Crank	Rear panel LO output to external equipment. Direct-reading, frequency-indicating tape dial with coarse tuning crank.

CHAPTER 1

GENERAL DESCRIPTION

1-1. INTRODUCTION.

1-2. This manual contains intermediate operation instructions, maintenance instructions, and parts list for Tuning Head SH-206P-6, Part Number 171AS567-3 (figure 1-1).

1-3. PURPOSE OF EQUIPMENT.

1-4. The Tuning Head is a continuously tunable solid-state unit capable of receiving and converting to 21.4 MHz IF signals from 1990 to 4000 MHz. The Tuning Head is mounted into the right side of Power Housing Unit PHU-201-3, PN 171AS567-1. Tuning Head SH-205P-6, PN 171AS567-2, with a range of 990 to 2000 MHz, is mounted into the left side of PHU-201-3. Together the three units comprise RF Downconverter, PN 171AS567.

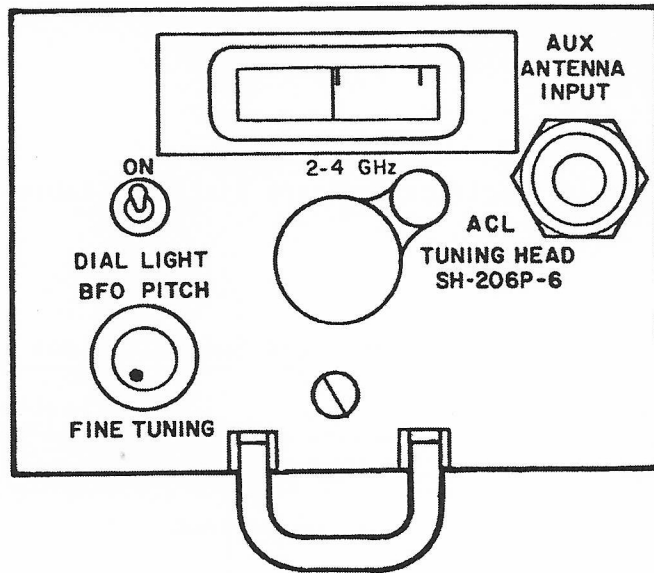
1-5. DESCRIPTION.

1-6. PHYSICAL. A single slotted thumbscrew secures the Tuning Head when installed. Refer to table 2-1 for physical details.

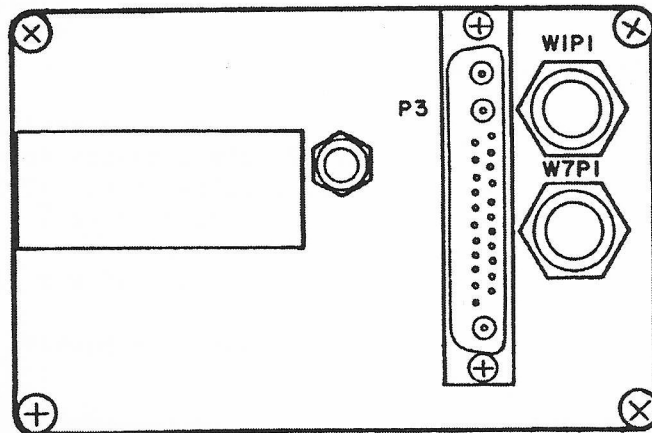
1-7. FUNCTIONAL. The Tuning Head is comprised of an RF Tuner (containing a tunable four-pole RF preselector, a crystal diode mixer, and a low-beat local oscillator), a 160 to 21.4 MHz Converter (containing a 160 MHz input amplifier, a high-beat local oscillator, a mixer, and a 21.4 MHz output amplifier), and a Feather Amplifier, which receives detected unamplified RF from the Converter, amplifies it, and routes it as Tuning Head output. Overall gain is approximately 55 dB.

1-8. The RIGHT RF GAIN Control of PHU-201-3 applies manual gain to the input and output amplifiers of the Converter. This control voltage extends the gain control range of the receiving system for high-level signals while keeping at a minimum the noise figure for low-level signals. All inputs and outputs, with the exception of RF input and local oscillator (LO) output, are wired into the single 22-pin connector on the rear panel, which mates with a female connector in the PHU-201-3.

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FRONT VIEW



REAR VIEW

Figure 1-1. Tuning Head SH-206P-6

CHAPTER 2
SPECIFICATIONS

2-1. INTRODUCTION.

2-2. Tuning Head SH-206P-6 specifications are listed in table 2-1.

Table 2-1. Tuning Head Specifications

Parameter	Specification
Frequency Range	1990 to 4000 MHz
Noise Figure	16 dB maximum
RF Gain	55 dB minimum
Intermediate Frequencies	160 and 21.4 MHz
Bandwidth	4 MHz $\pm 10\%$ at 3 dB points
First IF Rejection	90 dB minimum
Image Rejection	60 dB minimum
Input Impedance	50 ohms nominal, unbalanced to ground
Local Oscillator Radiation	300 uV maximum
Feather Characteristics	With 600-ohm load resistance, peak RF input of -20 dBm produces detected feather video output pulse of 0.3 ± 0.2 V; peak input of 0 dBm produces 3 ± 2 V.
Dimensions	3-1/2" H x 4-3/4" W x 13-3/4" D
Weight	Approximately 5 pounds

CHAPTER 3

OPERATION

3-1. INTRODUCTION.

3-2. This chapter contains information for operation, indicators, controls, and connectors for Tuning Head SH-206P-6.

3-3. OPERATING PROCEDURE.

3-4. For operating procedures, refer to the appropriate Power Housing Unit technical manual.

3-5. INDICATORS, CONTROLS, AND CONNECTORS.

3-6. All indicators and operating controls are located on the front panel. Except for AUX ANTENNA INPUT, all connectors are located on the rear panel. Refer to figure 1-1 for front and rear panel details. Table 3-1 lists controls, indicators, and connectors, with functions and reference designations.

Table 3-1. Indicators, Controls, and Connectors

Reference Designation	Indicator, Control, or Connector	Function
DS1	Dial Light	
	ON	Indicates that Tuning Head circuits are energized.
	Off	Indicates that Tuning Head circuits are deenergized.
P3	Connector	A 22-pin connector that routes all inputs and outputs except as noted below.
R1	FINE TUNING (Potentiometer)	Has a range of 50 kHz, and is tuned to center the IF within the passband.
R2	BFO PITCH (Potentiometer)	Has a range of 20 kHz. Provides an aural null in continuous wave (CW) operation.
S1	DIAL LIGHT (Toggle Switch)	
	ON	Energizes dial light.
	Off	Deenergizes dial light.

Table 3-1. Indicators, Controls, and Connectors (Cont)

Reference Designation	Indicator, Control, or Connector	Function
W1P1	BNC Connector	Routes RF into Tuning Head from external equipment.
W6J1	AUX ANTENNA INPUT (Connector)	Routes RF from front panel to Tuner.
W7P1	BNC Connector	Routes local oscillator output from rear panel Tuning Head to external equipment.
	Tape Dial and Tuning Crank	Direct-reading, frequency-indicating tape dial with coarse tuning crank.