



## FEATURES:

- Frequency Range: 20 to 1300 MHz
- Integral Search controller
- Computer Control - Optional
- Detection Modes:
  - AM, FM - Standard
  - SSB, CW, ISB - Optional
- Spectrum Display - Optional
- VHF Preselector - Optional

## DESCRIPTION

Covering the full 20 to 1300 MHz range, the Model 686A VHF/UHF Receiving System offers the user a powerful combination of operational and control modes that make it highly effective for both surveillance and general communication applications. The basic 686A Receiver functions as a general purpose, stand-alone, 20 to 1300 MHz AM/FM scanning receiver. Standard features include built-in UHF preselector, narrowband and wideband 21.4 MHz IF outputs, audio and video outputs, 100-channel memory storage with built-in search controller, up to eight selectable IF bandwidths, and a 1 MHz reference input. Optional features include either an IEEE-488 or RS-232C external computer interface, simultaneous AM and FM video outputs, log video output, and COR (carrier operated relay) output. Housed in a standard 1-3/4" high rack-mount chassis, the 686A provides a wealth of features in a compact package.

If additional capability is required, users can add the Model 6861 Expansion Unit. This unit provides the necessary space for additional options, including an IF display unit, X/Y/Z display outputs, VHF preselector, and CW/SSB/ISB demodulator. Also housed in a 1-3/4" high standard rack-mount chassis, the Model 6861 is designed to mount directly to the top of the Model 686A, resulting in an integrated 3-1/2" high receiving system. Interconnections between units are via short pre-assembled cables supplied by the factory.

Utilizing modular construction throughout, the Models 686A and 6861 are easily serviced by separating the two units and removing the top or bottom cover(s).

## SPECIFICATIONS

Frequency Range	20-1300 MHz
Frequency Resolution	1 kHz
Detection Modes	AM, FM - Standard CW, SSB and ISB - Optional
Outputs	IF, Video, Audio - Standard Simultaneous AM/FM Video, Log Video, COR - Optional
Tuning Speed (Nominal)	10 ms Synthesizer
Intermediate Frequency	21.4 MHz
RF Input Impedance	50 ohms
Input VSWR	2.5:1 nominal
Noise Figure	8 dB (20-500 MHz without VHF Preselector) 12 dB (20-1300 MHz with VHF Preselector)
3rd Order Input Intercept Point	0 dBm
External Reference Input	1 MHz
Internal Frequency Accuracy	+/-1x10 <sup>-6</sup>
Image Rejection	90 dB
IF Rejection (21.4 MHz)	90 dB
Phase Noise	
20-500 MHz	-90 dBc in 1 Hz BW at 20 kHz
500-1300 MHz	-80 dBc in 1 Hz BW at 20 kHz
Conducted L.O.	-85 dBm
Internal Spurs	-110 dBm (referred to input)
AGC/MGC Range	100/70 dB
RF-Wideband IF Gain	+25 dB nominal
IF Bandwidths	
-User Specified (8 max.)	10, 20, 50, 100, 300, 500, 1000, 2000, 4000, 6000, 8000 kHz
Sensitivity <sup>3</sup>	-95 dBm in 100 kHz IF bandwidth
AM SNR: 10 dB nominal <sup>1</sup>	
FM SNR: 17 dB nominal <sup>2</sup>	
Outputs	
IF	
Wideband	
Level	+25 dBm nominal
Bandwidth	8 MHz
Narrowband	
Level	-20 dBm (AGC'd)
Bandwidth	In accordance with selected bandwidth
Video	
AM/FM	Selectable (single connector) - Standard Simultaneous - Optional
Level <sup>4</sup>	2 Vp-p (50 ohms)
Bandwidth	dc to 1/2 IF Bandwidth

<b>Audio</b>	
Fixed Level	Rear panel
Level <sup>4</sup>	0 dBm (600 ohms)
Bandwidth	
AM/FM	300-8000 Hz
USB, LSB, ISB	300 to 2600 Hz - Optional
CW	Variable B.F.O. - Optional
Headphone	Front panel adjustable
Level <sup>4</sup>	0 to .25 Vrms (600 ohms)
Bandwidth	300 to 4000 Hz
COR	TTL - Optional
<b>Inputs</b>	
RF Input	
Level	-20 dBm to -110 dBm
External Reference	
Level	0.7 Vrms
Frequency	1 MHz
Stability	Better than $1 \times 10^{-6}$
Microprocessor	
Type	8088
Memory	RAM - 8 K EEPROM - 32 K Power-down backup
<b>IF Display - Optional</b>	
Sweep Width (Nominal)	8 MHz
Sweep Rate	5-25 Hz
Sensitivity <sup>5</sup>	-100 dBm
Response	Log or Linear (Switch Selectable)
Resolution	40 kHz
Image & IF Rejection	60 dB
CRT	Electrostatic 1 1/8"x3"
<b>Connectors</b>	
Model 686A	
Rear Panel	Input - Type N Outputs - BNC Control - IEEE--488 Optional or RS-232C Optional
Front Panel	Headphone Jack
Model 6861	
Rear Panel	X,Y,Z Outputs - BNC - Optional
<b>Receiver Controls (Front Panel)</b>	
Model 686A	BW, FREQ, AFC, SQUELCH, MGC, BFO, DEMOD, RUN, MODE, DATA, SEND, SLAVE, ENTER, CLEAR, RESET, AUDIO VOL, TUNING, KEY PAD, POWER

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Fixed Level	Rear panel
Level <sup>4</sup>	0 dBm (600 ohms)
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Model 6861	
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Model 686A	BW, FREQ, AFC, SQUELCH, MGC, BFO, DEMOD, RUN, MODE, DATA, SEND, SLAVE, ENTER, CLEAR, RESET, AUDIO VOL, TUNING, KEY PAD, POWER

Model 6861

IF Display Option

SWEEP WIDTH, SWEEP RATE, GAIN, MARKER, LIN/LOG, H POSITION,  
V POSITION, FOCUS, INTENSITY

Power

115/230 Vac, 47 to 420 Hz

Consumption

Model 686A

60 W

Model 6861

40 W

Temperature (Operating)

0° to 50°C

Style (Model 686A  
and Model 6861)

EIA standard chassis 1-3/4" high, 20" deep  
designed for 19" rack mounting (each unit)

Weight

35 lbs.

EMI

Designed to meet TEMPEST requirements

- 1 AM sensitivity measured with 50% AM at 1 kHz rate
- 2 FM sensitivity measured with deviation equal to 30% of selected IF bandwidth at a 1 kHz rate
- 3 Input -95 dBm, 100 kHz IF bandwidth
- 4 AM equal to 90%, FM equal to 95% of selected IF bandwidths at 1 kHz rate
- 5 Sensitivity defined in Linear Mode, 1 cm deflection, max. sweepwidth

Specifications may vary depending upon options and are subject to change.  
Valid over 90% of the band.

#### OPTIONS:

Model 686A

IEEE-488 Interface  
RS-232C Interface  
Simultaneous AM/FM Video Output  
Log Video Output  
COR Output

Model 6861

IF Spectrum Display  
VHF Preselector  
CW, SSB, ISB Demodulator  
X, Y, Z Output

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JUNE 1988