

**FEATURES:****FREQUENCY RANGE:**

20 TO 500 MHZ
20 TO 1300 MHZ (OPTIONAL)

DETECTION MODES:

AM, FM
SSB, CW, ISB (OPTIONAL)

INTEGRAL SEARCH CONTROLLER**INTEGRAL SPECTRUM DISPLAY****COMPUTER CONTROL****TEMPEST OPTION**

Covering the full 20 to 1300 MHz range, the Reaction Instruments Model 686 VHF/UHF Receiver offers the user a powerful combination of operational and control modes that make it highly effective for surveillance as well as general communication applications. Standard features include squelch, COR, AFC, and AGC. The frequency resolution of the receiver, 1 kHz (optionally, 100 Hz or 1 Hz) combined with a 10 millisecond tuning speed allow efficient search algorithms to be implemented either under the control of the internal search controller or by an external computer via the RS-232C or IEEE-488 interface. The receiver will demodulate a variety of signal types including AM, FM, CW, SSB, and ISB with IF bandwidths selectable in the range of 10 kHz to 8 MHz. An optional high-level IF output can drive specialized demodulators.

The Model 686 optionally includes an integral IF Spectrum Display and a preselector that make it fully operable in stand-alone applications. Alternatively, it may be configured with a Reaction Instruments Matrix Multicoupler, an IF Switch, and other signal distribution equipment as part of a receiver system.

The Model 686 VHF/UHF Receiver is packaged in a 3 1/2" high EIA standard chassis suitable for 19" rack mounting. A Tempest Option is available.

REACTION INSTRUMENTS, INC.
475 SPRINGPARK PLACE ■ HERNDON, VIRGINIA 22070
(703) 471-6060

MODEL 686 VHF/UHF RECEIVER

PERFORMANCE SPECIFICATIONS*

Frequency Range	20-500 MHz (20-1300 MHz optional)
Frequency Resolution	1 kHz (100 Hz and 1 Hz optional)
Detection Mode	AM, FM, (CW, SSB and ISB optional)
Outputs	IF, Video, Audio, C.O.R.
Tuning Speed (Nominal)	10 ms Synthesizer
Intermediate Frequency	21.4 MHz
RF Input Impedance	50 ohms
Input VSWR	3:1
Noise Figure	8 dB (20-500 MHz without Preselector) 12 dB (20-1300 MHz with Preselector)
Intermodulation	
IP3	0 dBm
External Reference	1 MHz
Internal Frequency Accuracy	+/-1:10 ⁶
Image Rejection	90 dB (20-500 MHz) 75 dB (500-1300 MHz)
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 (20-500 MHz) -80 dBm (500-1300 MHz)
Internal Spurs	-105 dBm (referred to input)
AGC/MGC Range	100/70 dB
RF-Wideband IF Gain	+20 dB nominal
IF Bandwidths	
-User Specified (4 max.)	10, 20, 50, 100, 300, 500, 1000, 2000, 4000, 6000, 8000 kHz
AM Sensitivity ^{1,3}	10 dB nominal
FM Sensitivity ^{2,3}	17 dB nominal
Outputs	
IF	
Wideband	
Level	+20 dBr nominal BW 8 MHz

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 -93 dBm, 100 kHz IF bandwidth

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

MODEL 686 VHF/UHF RECEIVER

PERFORMANCE SPECIFICATIONS (cont'd)

Video

AM/FM	Selectable (single connector) Simultaneous (Optional)
Level ⁴	2 V pk-pk (50 ohms)
BW	dc to 1/2 IF BW ³

Audio

Fixed Level	Rear panel
Level ⁴	1.7 VRMS (600 ohms)
BW:	
AM/FM	300-8000 Hz
USB, LSB, ISB	300 to 2600 Hz
CW	Variable B.F.O.
Headphone	Front panel adjustable
Level ⁴	0 to .6 Vrms (600 ohms)
BW	300 to 4000 Hz
COR	TTL

Inputs

RF Input	
Level	-20 dBm to -110 dBm
External Reference	(Option)
Level	0.7 Vrms
Frequency	1 MHz
Stability	Better than 1:10 ⁶

Microprocessor

Type	8088
Memory	RAM - 8 K EEPROM - 32 K Power-down backup

⁴ AM equal to 75%: Peak FM deviation equal to 50% of selected IF bandwidths at 1 kHz rate

MODEL 686 VHF/UHF RECEIVER

PERFORMANCE SPECIFICATIONS (cont'd)

IF Display

Sweep Width (Nominal)	8 MHz
Sweep Rate	5-25 Hz
Sensitivity ⁵	-100 dBm
Response	Log or Linear (Switch Selectable)
Resolution	40 kHz (other values optional)
Image & IF Rejection	60 dB
CRT	Electrostatic 1 1/8"x3"

⁵ Sensitivity defined in Linear Mode, 1 cm deflection, max. sweepwidth

GENERAL

Style

EIA standard chassis 3 1/2" high, 20" deep
suitable for 19" rack mounting

Connectors -

Rear Panel

Input Signal - Type N (2)
Output Signals - BNC
Control - IEEE 488 (Optional)
RS-232C (Optional)

Front Panel

Receiver Controls - Front Panel

Headphone Jack - Audio
B.W., Freq., AFC, Squelch, MGC, BFO,
Demod., Run, Mode, Data, Send, Slave,
Enter, Clear, Reset, Audio Vol., Tuning,
Key Pad, IF Display, Power

Power

115 Vac, 60 Hz, 100 watts
220 Vac, 50 Hz (Optional)

Temperature (Operating)

0° to 50°C

Weight

35 lbs.

EMI

TEMPEST (Optional)

OPTIONS:

686-1 Freq. Extension to 1300 MHz
686-2 IF Spectrum Display
686-3 Preselector (VHF or UHF)
686-4 CW Demodulation
686-5 SSB Demodulation
686-6 ISB Demodulation

686-7 IEEE-488 Interface
686-8 RS-232C Interface
686-9 External Reference
686-10 Front Panel
686-BW IF Bandwidths (Specify)
686-T Tempest

686-10-87