

MICRO-TEL & REACTION INSTRUMENTS



FEATURES

- Receiver
 - Range: 20 to 500 MHz
 - Four IF Bandwidths
 - Tuning Speed: 10 ms
- Search Controller
 - Operating Modes: Step, Scan, Priority
 - Sweep: Continuous, Dwell, Freeze
 - Master/Slave Hand-Off
- IF Pan Display
- Signal Activity Monitor
 - Controls Display
 - Displays up to 15 Active Signals

DESCRIPTION

The Model 685A/SYS VHF/UHF Receiver System is a highly versatile VHF/UHF surveillance receiving system with activity monitoring capability, which covers the 20-500 MHz range and is controlled by a menu-driven controller in a user-specified search pattern. A basic system consists of a receiver, a search controller, an IF display and a signal activity monitor. The system can optionally be expanded to include an externally mounted frequency extender (500-1300 MHz), audio amplifier/speaker unit, slave receivers, VHF preselector, IF to Tape Converters, multicouplers and matrices. Custom rack frames to accommodate these units can also be provided.

The four units of the basic system are housed together in a rack-mountable frame assembly. Each unit derives its ac power from an outlet on the rear of the frame, which in turn connects to the power source via a single ac power cord. A single On-Off power switch and fuse for the entire system is contained on the frame assembly. Each unit is packaged in a 1-3/4" high half rack chassis. The complete system is only 5-1/4" high.

Model 685A Receiver

The Model 685A Receiver is a synthesized, digitally controlled receiver, covering the 20-500 MHz range. Features include AM and FM detected video as well as audio outputs, four user-selected IF bandwidths (10 kHz to 8 MHz), noise-riding threshold/COR, AFC and AGC.

Model 6852 Search Controller

The Model 6852 Search Controller is the major microcomputer element of the 685A/SYS Receiving System. It supports data entry to configure the modes of operation, and controls the search, handoff, and other functions of the 685A Receiver. The unit also transfers signal activity status to the Model 6853 Signal Activity Monitor and acts as the system interface for external computer control and/or control of additional receivers via an IEEE-488 external interface. The search controller may optionally contain a VHF preselector for the 685A Receiver and/or an antenna selector.

Operation modes include step and scan. In the step mode, the receiver can be programmed to search 100 frequencies with several different types of "listen and proceed" instructions. Fifteen signals can be designated as "high priority" and be searched at a more frequent rate. In the scan mode, up to eight bands can be searched and a high-priority band as well as lock-out bands can be designated. Non-volatile memory is provided.

Model 695A IF Display

The Model 695A IF Display serves as an IF spectrum display which shows real-time signals present in the wideband IF output of the Model 685A (21.4 MHz center frequency). When interfaced with the Signal Activity Monitor, the IF Display, provides digital mapping of signal activity. The display features high sensitivity, high intercept points and high resolution. Front-panel selection of either linear or log display and a built-in marker to indicate the center of the passband are provided.

Model 6853 Signal Activity Monitor

The Model 6853 Signal Activity Monitor serves as the interface which allows the Model 695A IF Display to function as an activity monitor. When interfaced with the Signal Activity Monitor, the Model 695A provides digital mapping of signal activity. In that case, the first fifteen active frequencies for each band and for the priority listing, as selected by the operator, can be displayed on the CRT of the Model 695A.

A cursor can be positioned at any active frequency as displayed on the 695A CRT, and that frequency can then be read on the signal activity monitor's alphanumeric display. In addition, all receiver parameters associated with the selected frequency can be transferred back to the 685A Receiver via the 6852 Search Controller, for automatic tuning of the receiver.

The signal activity monitor also contains the signal strength circuitry for the display activity, and the COR relay contacts.

SPECIFICATIONS

685A VHF Receiver

Frequency Range	20-500 MHz
Frequency Resolution	1 kHz
Detection Modes	AM, FM
Outputs	IF, Video, Audio, COR
Tuning Speed (within 1 kHz of tuned frequency)	10 ms with search controller
Intermediate Frequency	21.4 MHz
RF Input Impedance	50 ohms
Input VSWR	2:1
Noise Figure	8 dB, maximum, without preselector 10.5 dB with optional preselector
3rd Order Input Intercept Point	0 dBm
External Reference Frequency Accuracy	1 MHz $\pm 1 \times 10^{-6}$
Image Rejection	90 dB
IF Rejection (21.4 MHz)	90 dB
Phase Noise	-90 dBc in 1 Hz bandwidth, 10 kHz from carrier
Antenna Conducted LO	-85 dBm
Internal Spurs	-110 dBm, typical, (referred to input) -100 dBm, maximum

Gain Control Range	AGC: 95 dB, MGC: 70 dB
RF-IF Gain (Wideband Output)	25 dB minimum
IF Bandwidths —User Specified (4 maximum)	10, 20, 50, 100, 300, 500 kHz, 1, 2, 4, 6, 8 MHz, (others available on special order)
Sensitivity AM SNR: 10 dB nominal¹	-95 dBm in 100 kHz IF BW
FM SNR: 17 dB nominal²	
IF Outputs	
Wideband	
Level	+25 dB
Bandwidth	8 MHz
Narrowband	
Level	-20 dBm (AGC)
Bandwidth	In accordance with selected bandwidth
Video Outputs	
AM/FM	Selectable (single connector) - Standard Simultaneous (two connectors) - Optional
Level³	2 Vp-p (50 ohms)
Bandwidth	dc to 1/2 IF BW
Audio Outputs	
Fixed Level	Rear panel
Level³	1.7 Vrms (600 ohms)
Bandwidth	300-8000Hz

SPECIFICATIONS (Continued)

Headphone Level	Front panel adjustable 0 to 0.6 Vrms (600 ohms) min.
Bandwidth	300 to 4000 Hz
Connectors - RF Input	Type N female
Output Signals	BNC female
Digital Control	IEEE-488 Communications (DE-15)

Connectors	
Front Panel Audio	Headphone Jack
Power	115/230 Vac, 47-420 Hz
Temperature - Operating	0° - 50°C
Style	1-3/4 inches high by 8-1/2 inches wide by 20 inches deep

¹AM sensitivity measured with 50% AM at 1 kHz rate

²FM sensitivity measured with deviation equal to 30% of selected IF bandwidths at a 1 kHz rate

³Measured with maximum deviation in FM, and 80% modulation in AM mode

MODEL 6852 SEARCH CONTROLLER

Operating Modes	Step, Scan, Priority
Front Panel Controls	Display Up/Down, Mode, Data, Stop/Run, Master, Local/Remote, Power
Data Entry	Numeric keypad, plus CLR, ENT, RESET pushbuttons
System Interface	COMM I/O 15-pin D connector
External Interface	IEEE-488

Preselector	VHF, Switched/Filter - Optional
Power	115/230 Vac, 47-420 Hz
Temperature - Operating	0° - 50°C
Style	1-3/4 inches high by 8-1/2 inches wide by 20 inches deep
Weight	10 lbs.

695A IF DISPLAY

Number of Inputs	One
Input Center Frequency	21.4 MHz
Number of Displayed Inputs	One
Input Impedance	50 ohms
Sweep Width (Nominal)	8 MHz
Sweep Rate (Nominal)	5 to 25 Hz
Sensitivity	-90 dBm
Gain Control	60 dB
Display Modes	Log or Linear (switch selectable)
Resolution	40 kHz (other values available on special order)
Image Rejection	60 dB
IF Rejection	60 dB

3rd Order Input Intercept Point	+5 dBm
Connector - Rear Panel	Input - BNC female
Controls	
Front Panel	LOG/LIN, SWEEP WIDTH, SWEEP RATE, GAIN, MARKER, FOCUS, INTENSITY, Vertical and Horizontal Centering, POWER
Rear Panel	FORWARD/REVERSE SWEEP
CRT	Electrostatic, 1-1/8 inches by 3 inches
Power	115/230 Vac, 47-420 Hz
Temperature - Operating	0° - 50°C
Style	1-3/4 inches high by 8-1/2 inches wide by 20 inches deep

MODEL 6853 ACTIVITY MONITOR

Display Modes	Normal SDU or Activity Monitor
Front Panel Controls	Cursor Left/Right, Signal Strength, Activity/IF, Band, Frequency, Send, Power
Systems Interface	COMM I/O 15-pin connector
Power	115/230 Vac, 47-63 Hz

Temperature - Operating	0° - 50°C
Power	115/230 Vac, 47-420 Hz
Size	1-3/4 inches high by 8-1/2 inches wide by 20 inches deep
Weight	8 lbs.

ORDERING INFORMATION

A standard Model 685A/SYS Receiving System consists of a Model 685A VHF Receiver (20-500 MHz), a Model 695A IF Display with a single input (21.4 MHz IF), a Model 6852 Search Controller without VHF Preselector, and a Model 6853 Signal Activity Monitor. Units are mounted in a 5-1/4" high, full-rack power frame, and system-interconnect cabling is provided. Receiver IF bandwidths must be specified from the options list below. Externally mounted expansion units, including a frequency extension unit (500-1300 MHz) are available separately. When ordering, please specify:

685A/SYS Receiving System

Option B14	10 kHz IF Bandwidth
Option B24	20 kHz IF Bandwidth
Option B54	50 kHz IF Bandwidth
Option B15	100 kHz IF Bandwidth
Option B35	300 kHz IF Bandwidth
Option B55	500 kHz IF Bandwidth

Option B16	1 MHz IF Bandwidth
Option B26	2 MHz IF Bandwidth
Option B46	4 MHz IF Bandwidth
Option B66	6 MHz IF Bandwidth
Option B86	8 MHz IF Bandwidth
Option F10	(Search Controller) Switched/Filter VHF Preselector

WARRANTY

All of Reaction Instruments' equipment is warranted for one year, except for damage caused by accident or misuse, provided the equipment is returned for repair to the plant in Herndon, VA



685A/SYS — Rear View



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