Wireless Radio Test Sets

IFR 2975 Project 25 Radio Test Set

AEROFLEX
A passion for performance.

A test solution designed from the ground up to handle today's advanced digital radio applications

Expanded Service Monitor Functions

- 2.7 GHz Frequency Range with 2.7 GHz Spectrum Analyzer and Tracking Generator

- "Try before you buy" Options

- New PassPort® Radio Test Option

- New Secondary Control Channel Broadcast Messaging Option

- 500 kHz (Useable) Dual-Channel Oscilloscope

- New Scope Markers

- New Capture for Front Screen Displays

- New Vrms Selection for Audio Function Generators

- New Demod Audio Routing to RF Generator

- 12.5, 25, 60 and 200 kHz IF Filters

- User Selectable Audio Filters

- Tone Signaling/Tone Remote Functions

- Auto-Tune Capabilities

- LTR® Trunking Option

- 40 kHz Audio Analyzer w/ Tracking Generator

- ANS KVL Support Option

Exclusive P25 Test Features

- New Explicit Messaging Option

- New Adjacent Status Broadcast Messaging

- P25 Trunking Emulation

- Exclusive P25 Inbound Signaling Packet (ISP) Decode Function

- New Unit to Unit and PSTN Interconnect Option for Explicit Messaging

- Exclusive P25 Outbound Signaling Packet (OSP) Message Programmer

- Full TIA/EIA-102 Test Patterns

- AES and DES OFB Type III Encryption

- CQPSK Transmit and Receive

- CQPSK EVM and Constellation Display Exclusive SmartNet™/SmartZone™ Tests

- Control Channel Assignment to P25 or SmartNet™/SmartZone™ Traffic Channel

Innovative Control and Operational Features

- Internet Remote Operation

- Quick Tune Spectrum Analyzer

- PS-2 Keyboard and Mouse Operation

- IP Addressable

- RS-232, GPIB and Ethernet Operation

The NEW Standard for P25 Testing

Since 1976, Aeroflex has provided cutting-edge test solutions to the mobile radio industry. Aeroflex carries on that tradition with the IFR 2975 Radio Test Set. It's a test solution designed from the ground up to handle today's advanced communication applications.
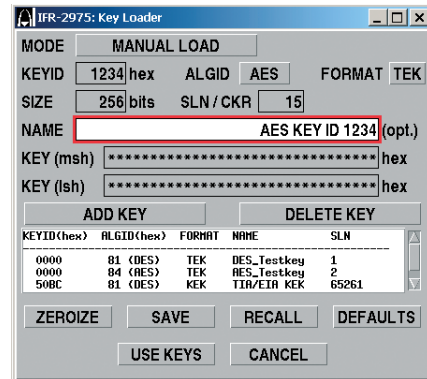
- Project 25 parametric, protocol and Common Air Interface testing

- IMBE vocoder and data encryption tests

- Modulation and demodulation of C4FM and CQPSK

- AES and DES OFB Type III encryption/decryption support

- Exclusive standard C4FM Modulation Fidelity meter and CQPSK EVM option allows for true transmitter alignment

"Try before you buy" for IFR 2975 Test Set Options

The IFR 2975 offers unique "try before you buy" options where customers can try an option before purchase. Owners of IFR 2975 test sets can try IFR 2975 options for up to 30 days before making an investment decision. Once the choice is made, the options can be enabled in the field. Options for the IFR 2975 radio test set include:
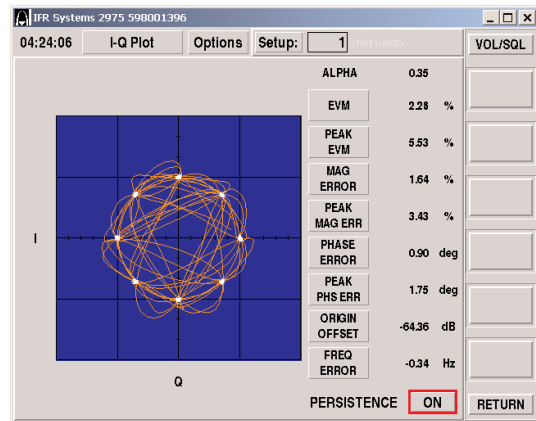
- **PassPort® Option:** provides the latest features for testing PassPort® radios and repeaters. This includes the new VHF PassPort® functions being deployed.

- **Explicit Messaging Option:** supports explicit messaging for trunked VHF/UHF radio systems that use this extended messaging for the latest P25 trunking systems.

- **SCCB Messaging Option:** supports the Secondary Control Channel Broadcast message for either explicit or normal P25 trunked operation. The addition of this feature allows the user to set up simulated control channels to verify how P25 radios switch over to secondary control channels.

- **Adjacent Status Broadcast Messaging Option:** supports the Adjacent Channel Broadcast message for explicit P25 trunked operation. The addition of this feature allows the user to set up a simulated adjacent control channel to verify how P25 radios switch over to adjacent control channels in roaming modes.

- **Unit to Unit and PSTN Interconnect Option:** supports Unit to Unit and PSTN interconnect calls in the explicit mode of operation. This feature allows users to verify that a radio can generate and receive Unit to Unit and PSTN calls.

- **Advanced Encryption Systems (AES) Option:** Includes support for higher security features as well as continued support for the current Digital Encryption System (DES) Type III used in existing P25 systems.

- **Encryption Key Management Option:** Provides the ability to fully manage keys via the KVL-3000+™ using the P25 key management protocol including the ability to load individual, multiple and groups of keys. The IFR 2975 also supports programming of keys through the front panel for manual key management.

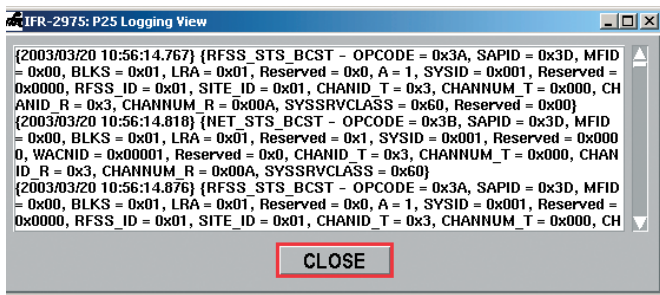*Encryption Key Management with AES Support*

- **ASN KVL Support Option:** supports this legacy keyloader mode used with older KVL-3000 and earlier keyloaders.

- **CQPSK Modulation™ Option:** With both transmitter and receiver tests, the IFR 2975 now supports parametric measurements for repeater tests utilizing CQPSK modulation for LSM applications.

CQPSK Analysis for LSM Systems

- **CQPSK Option:** This enables all the functionality of the IFR 2975 for use in 6.25 kHz bandwidths.

- **Control Channel Logging Option:** This exclusive feature for P25 trunked operations allows users to verify conformance with various P25 radio systems offered by a number of different manufacturers.

P25 Control Channel Logging

- **P25 Trunking Protocol Option:** With the ability to optionally set P25 OSP messages for control channel and decode ISP messages from user radios, the IFR 2975 verifies protocol operation of radios on P25 networks.

- **VHF/UHF and 800 MHz SmartNet™/SmartZone™ Option:** Support for SmartNet™/SmartZone™ Motorola trunked radio system testing.

- **900 MHz Band Option:** Support for SmartNet™/SmartZone™ systems used in commercial business applications.

- **LTR® Trunking Option:** Support for both repeater simulator and mobile simulation.

- **0 - 40 kHz Audio Analyzer Option:** Support for extended audio analysis.

- **Analog Simulcast Option:** Allows for fast alignment of analog simulcast systems.

- **BER Tests Option:** Allows for TX BER as well as RX BER measurements using a defined serial connection.

- **Auto-Test Application Option:** Speeds testing and logging of test results on analog and P25 conventional radio systems.

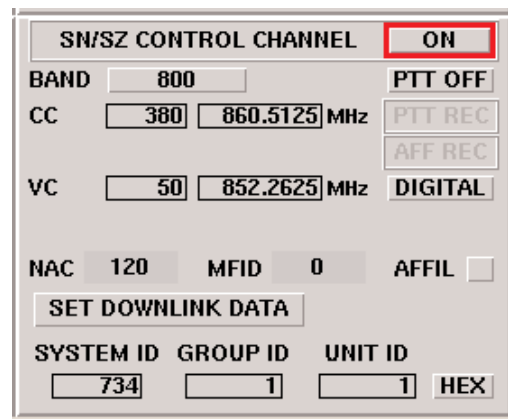### P25 Trunking Test Gives Flexibility to P25 Radio Testing

With the optional P25 Trunking application, the IFR 2975 now provides test professionals the ability to quickly and dynamically test P25 mobile subscriber units operating in the VHF/UHF, 700 MHz and 800 MHz bands. The IFR 2975 provides the required P25 control channel with user defined parameters for Unit/Group call procedures including the exclusive ability to set downlink OSP control channel message elements and to decode the uplink ISP messages for use in verification of mobile interoperability. With P25 Trunking (Options 4 and 14), the user can initiate tests without the need to go through a predetermined test sequence. These tests include transmitter verification of performance and receiver sensitivity tests that are separate, easy tests. With the IFR 2975's exclusive "meter panel", test times for subscriber units can be reduced to less than 30 seconds!

P25 Trunking Options

SmartNet™/SmartZone™ Test Functions Provide Ways to Test Motorola Trunked Radio Systems (Options 3 and 8)

With the optional SmartNet™/SmartZone™ application, the IFR 2975 provides innovative ways to test trunked radio systems including a new "scanner" mode that allows the user to follow a call from the control channel to the voice channel. This unique function allows for fast testing of system operation as well as RF performance tests. The IFR 2975 also provides the ability to hand off to a P25 traffic channel directly from a SmartNet™ II Control Channel, allowing for interoperability testing in a repeater mode.

SmartNet™/SmartZone™ Test Capabilities

Full-Featured Communications Test System

For complete transmitter spectrum performance testing, swept antenna and transmission line testing and at-a-glance troubleshooting, the IFR 2975 comes standard with a digitized 2.7 GHz spectrum analyzer and dual-channel digital storage oscilloscope. In addition, the IFR 2975 provides you with the functionality of over 20 discrete instruments integrated into a single platform. The IFR 2975 provides all the tools you need to perform comprehensive RF testing as standard equipment.

- RF Receive/Generate with full cross band Duplex Operation

- AM/FM/C4FM Modulation and Demodulation

- RF Power/Frequency/Frequency Error/Distortion/SINAD/Voltage Meters with PASS/FAIL Go - NoGo testing.

Color Coded Meters Speed Test Time

- Repeater simulation for Project 25 compliant radio testing in the conventional mode

- IF Filter settings match real-world application, with 12.5 kHz, 25 kHz, 60 kHz and 200 kHz selectable (FM)

- Extended post-detection audio filters

- Full-feature store and recall functions

- Tone and tone remote signaling

- Spectrum Analyzer and Tracking Generator from 1 MHz to 2.7 GHz

- 500 kHz (Useable) Dual-Channel Oscilloscope

High Tech Testing That's Easy To Use

Building advanced functionality into a test instrument means little if it's too complex to use efficiently. That's why we've focused on ensuring the IFR 2975's advanced functions are easily harnessed.

Exclusive control features include a standard communication service monitor look and feel with push-key entry and soft-key functions for routine daily work. But added to this conventional operation is the power of today's technology including:

- Ethernet for remote control flexibility

- Internal web server for accessing files, status updates and remote display operation

- E-Manual support allows you to upload test and alignment procedure for display directly on the IFR 2975

- PS2 keyboard and mouse operation

- Full GPIB and RS-232 interface with Remote Command Language

- On-board 20 GB hard drive to support future enhancements

Exclusive Spectrum Analyzer Features Include "Quick Tune" Feature

Tuning the spectrum analyzer is as simple as a double click on the mouse. With Aeroflex's exclusive "Quick Tune" spectrum analyzer, the IFR 2975 allows you to double click a signal on the spectrum analyzer screen and the analyzer will automatically change center frequency to the selected frequency.

Supports Network Connectivity

Another key advancement is the use of modern network and connectivity technology. The IFR 2975 employs ethernet as one of its communication ports, thus allowing remote operation and data collection. You can also redirect display and keypad operations and software upgrades can be installed quickly over the internet, saving you valuable time and virtually eliminating instrument downtime.

Man-Machine Interface

The high-resolution color display and alphanumeric keypad with multi-function soft keys provide a user-friendly interface. The menu structure has been enhanced to make complex test routines simple and straightforward. A 20 GB internal hard drive and 3.5 in. floppy drive simplify program installation and maximize flexibility in storage and recall of setup information, frequency lists and test data.

Portability

At 15 kg (33 lbs.), the IFR 2975 is perfect for the field technician with a lot of ground to cover. Plus, its rugged design makes it an ideal solution for the rigors of the field.

SPECIFICATION

GENERATOR (RECEIVER TEST)

GENERATE PORT

Port Protection

10 W (+40 dBm) for 30 sec.

FREQUENCY

Range

1 MHz to 2.7 GHz

Resolution

1 Hz

Accuracy

Same as Time Base

OUTPUT LEVEL

GENERATE PORT

Range

+10 to -110 dBm

Resolution

0.1 dB

Accuracy

±1.5 dB (<1.3 GHz), ±2.5 dB (>1.3 GHz)

T/R PORT

Range

-30 to -137 dBm

Resolution

0.1 dB

Accuracy

±1 dB (<1.3 GHz >-120 dBm); ±1.5 dB (>1.3 GHz >-110 dBm)

SPECTRAL PURITY

Harmonic Spurious

-25 dBc max >50 MHz

Non-Harmonic Spurious

-40 dBc max <1.5 GHz

-30 dBc max >1.5 GHz

Residual FM

<15 Hz rms (Post Detection BW = 300 Hz to 3 kHz)

SSB Phase Noise (20 kHz offset)

-100 dBc/Hz typical, -92 dBc/Hz max (<1 GHz), -90 dBc/Hz max (>1 GHz)

Residual AM

0.1% (Post Detection BW = 300 Hz to 3 kHz)

GENERATOR MODULATOR

FM

Deviation Accuracy

3%, +residual, ±LSD (1 to 20 kHz deviation, 1 to 10 kHz rate)

5%, +residual, ±LSD (>20 kHz deviation, 1 to 20 kHz rate)

Deviation Range

Off, 10 Hz to 40 kHz deviation

Deviation Resolution

10 Hz

Modulation Rate Bandwidth

50 Hz to 20 kHz (MOD 1, MOD 2 and Audio in [SINAD] unbalanced)

50 Hz to 20 kHz (Audio in [SINAD] balanced and Mic in)

Modulation Distortion (THD)

1% (1 kHz rate, 6 kHz deviation, 50 Hz to 20 kHz bandwidth)

External FM Sensitivity

Audio in 1

1 Vpp = 4 kHz deviation ±15% (50 Hz to 10 kHz unbalanced)

1 Vpp = 4 kHz deviation ±15% (50 Hz to 10 kHz balanced)

MIC input

1 Vpp = 40 kHz deviation ±15% (300 Hz to 3 kHz)

AM

AM Depth Range

30% to 90%

Resolution

1%

Rate

100 Hz to 3 kHz

Accuracy

±5% (of full scale) + residual AM + resolution (1 kHz rate, RF Level <-40 dBm T/R, <0 dBm Gen Port)

Distortion

4% Typical (30% to 90% modulation, 1 kHz rate, 0.3 to 3 kHz BW, RF Level <-40 dBm T/R, <0 dBm Gen Port)

DIGITAL MODULATION FORMATS

C4FM at 9.6 kb/sec

FSK Error

<1% typical, <2% max

Project 25 Compliant Signals

1011 Hz tone

5% BER calibration tone

Speech (repeated test phrases)

Silence

Voice from audio inputs

ADDITIONAL MODULATION FORMATS

DTMF, tone, tone signalling, DCS, CTCSS, tone remote, ARB with recorded voice data for syllabic squelch test.

RECEIVER (TRANSMITTER TEST)

FREQUENCY RANGE

1 MHz to 2.7 GHz

T/R PORT

VSWR - T/R Port

<1.2:1 to 1 GHz, <1.3:1 >1 to 2.7 GHz

Maximum Power

50 W continuous, 125 W 1 min on/4 min off

Alarm

Alert sounds at 100°C pad temp or 135 W

ANTENNA PORT

Maximum Power

10 W (+40 dBm) for 30 sec.

Alarm

Switches to alarm on at 100 mW input (nominal)

FILTERS

IF Filters

FM - 12.5 kHz, 25 kHz, 60 kHz, 200 kHz

AM - 6.25 kHz, 12.5 kHz, 25 kHz, 60 kHz, 200 kHz

P25 - 6.25 kHz, 25 kHz

FREQUENCY COUNTER/FREQUENCY ERROR METER

Accuracy

Same as timebase ±LSD

Resolution

1 Hz

FM DEVIATION METER

Meter Range

5 kHz, 10 kHz, 20 kHz, 50 kHz, 100 kHz, Auto

Resolution

10 Hz

Demod Output Sensitivity

1 Vpp = 5 kHz typical

Accuracy

±5%, ±2 LSD +residual FM (12.5 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <5 kHz)

±5%, ±2 LSD +residual FM (25 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <10 kHz)

±5%, ±2 LSD +residual FM (60 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <25 kHz)

±7%, ±2 LSD +residual FM (200 kHz bandwidth, 50 to 20 kHz rate, deviation >5 kHz and <40 kHz)

AM MODULATION METER

Mod Depth

1% to 100%

Resolution

0.1%

Accuracy

±5% of full scale +source residual AM
(6 kHz IF BW, 1 kHz tone, 10%-90% AM depth)

Modulation Rate

10 Hz to 3 kHz

Carrier Range

1 MHz to 2.7 GHz

RECEIVE SIGNAL STRENGTH LEVEL METER

Sensitivity

-70 to -20 dBm (no input attenuation selected)

Usable Input Range -80 to -10 dBm (no input attenuation selected)

Resolution

0.1 dB

Accuracy

±1.5 dB

BROADBAND POWER METER FUNCTIONS (T/R PORT)

Accuracy

10% ±LSD

Meter Range

100 mW to 200 W in 1, 2, 5 sequence

Dynamic Range

100 mW to 125 W

Resolution

3 digits

NARROWBAND POWER METER FUNCTIONS (T/R PORT)

Accuracy

±1.5 dB (input level =+27 dBm); ±3 dB typical > +27 dBm

Meter Range

1 μW (-30 dBm) to 200 W (+53 dBm)

Resolution

3 digits

RECEIVE AUDIO FREQUENCY COUNTER

Accuracy

Same as timebase ±1 Hz

Resolution

0.1 Hz/1 Hz

RECEIVE SINAD METER

Accuracy

±1 dB ±1 LSD @ 1 kHz rate and 12 dB SINAD

Resolution

0.1 dB

Test Frequency

1 kHz

RECEIVE DISTORTION METER

Accuracy

±1.5% ±1 LSD @ 1 kHz rate @ 5% distortion

Resolution

0.1%

Test Frequency

1 kHz

Meter Range

5%, 10%, 20%, 50%, 100% full scale ranges

DIGITAL DEMODULATION METERS

C4FM FSK ERROR

<2% + residual, 3% to 10% reading, 400 symbols

SPECTRUM ANALYZER FUNCTIONS

SWEEP (HORIZONTAL) ACCURACY

Frequency Range

1 MHz to 2.7 GHz

Frequency Resolution

1 Hz

Span Accuracy

±1% of (total) Span Width

Frequency Display

Span accuracy +Frequency standard accuracy +50% of RBW

Sweep Rate Range

200 ms to 7 sec

Sweep Rate Accuracy

1%

HARMONIC SPURIOUS

-55 dBc @ -40 dBm (antenna port, no input attenuation)

NON- HARMONIC SPURIOUS

-60 dBc (10 MHz to 2.7 GHz) (antenna port, no input attenuation)

RESIDUAL SPURIOUS

-80 dBm (input terminated, antenna port, no input attenuation)

AMPLITUDE (VERTICAL)

Level Accuracy

±2 dB @ -30 dBm, input, -20 dBm Ref level (normalized) Antenna port, no input attenuation (typical)

Scales

2, 5 and 10 dB/div

LOG Linearity

±2 dB

Reference Level Resolution

0.1 dB

Attenuator Range

T/R: 0 to 40 dB (10 dB steps, auto-coupled to reference level)

Ant: 0 or 10 dB (auto-coupled to reference level)

Attenuator Accuracy

±0.5 dB/step, up to ±1 dB max (typical)

DYNAMIC RANGE

Antenna Port

<-100 (depends on RBW) to -20 dBm (no attenuation) ≤ -10 dBm with 10 dB attenuation)

T/R Port

<-30 to +30 dBm (no attenuation)

Typical Noise Floor Performance

-110 dBm, 10 MHz to 2.7 GHz (300 Hz resolution bandwidth)

Residual Phase Noise

-92 dBc/Hz @ 20 kHz offset

RESOLUTION BANDWIDTH

Analyzer Screen

300 Hz, 3 kHz, 30 kHz, 60 kHz, 300 kHz, 6 MHz

Generate and Receive Screens

300 Hz, 3 kHz, 60 kHz

Selectivity

60 dB/3 dB ratio <15:1

Bandwidth Switching Error

±1 dB

VIDEO BANDWIDTHS

None, 10 Hz to 3 MHz in 1-3-10 steps

SPECIAL FUNCTIONS

Display Modes

Live, Average, Peak, Compare, Tracking Generator, Coupled/Uncoupled (span/sweep time/RBW)

SPECTRUM ANALYZER VIDEO OUTPUT

Reference Level

= -5 V

Bottom-of-Screen

= +5 V

TRACKING GENERATOR

Frequency Range

10 to 2700 MHz

Output Level Range

Generator Port: +10 to -110 dBm

T/R Port: -30 to -137 dBm

Output Level Resolution

0.1 dB

Output Flatness

±2 dB ≤500 MHz span up to 1250 MHz center frequency

OSCILLOSCOPE FUNCTIONS

VERTICAL INPUTS

Input Channels

2 input channels (Ch1 and Ch2), MIC Input, Audio I/O Input, Internal Demodulation

Input Impedance

1 MΩ

External Coupling

AC, DC and GND

Range

20 mV to 50 V/div in a 1, 2, 5 sequence

Accuracy

10% of full scale (DC to 50 kHz, source impedance <100)

Bandwidth

500 kHz usable

HORIZONTAL SWEEP

Range

10 µs/div to 1 sec/div

Accuracy

1% of full scale

TRIGGER SOURCE

Channel 1, Channel 2, Internal or External Trigger

External Trigger: expects a TTL level (2 V-trigger level)

SPECIAL FUNCTIONS (Markers, Delay, etc.)

Modes: Live, Triggered Mode (Auto, Normal, Single shot trigger, persistence)

SMARTNET™ /SMARTZONE™ TRUNKING OPTION

Signaling Types

SmartNet™, SmartZone™ (Type II)

Call Tests

Analog and P25 (Digital Traffic Channel) Mobile Initiated tests and System Initiated tests

Testing Results

Power, frequency error, RSSI, deviation, sensitivity, SINAD, audio counter, C4FM EVM, distortion

Protocol Trunking Message Elements

Analog: System ID, Group ID (Automatically determined upon PPT), Unit ID (Automatically determined upon PTT), Frequency Band, Control Channel, Traffic Channel (by frequency and channel number) Digital (P25 Traffic Channel): System ID, Group ID (Automatically determined upon PPT), Unit ID (Automatically determined on PPT), NAC and MFID (Automatically detected upon PPT), Frequency Band, Control Channel, Traffic Channel by Frequency and Channel Number)

Frequency Bands

851 - 870 MHz, 866 - 870 MHz Split Channel,

403 - 522 MHz UHF, 132 - 175 MHz VHF, User defined

Channel Plan Entry for VHF/UHF

Separate transmitter and receiver start-and-end frequency for threeblocks. Independent channel spacing for each block.

Special Features

SmartNet™/SmartZone™ trunking channel assignment to P25 traffic channel

Control Channel Scanner

Search and find control channel within the channels bands. Search by channel number with automatic verification and display of found control channels. Found control channels also display System ID information automatically. Upon selection of live control channel, the 2975 will track control channel, group ID or unit ID traffic.

Configuration Bands

800, 800 Splinter, VHF/UHF, 900, User Defined

LTR® TRUNKING OPTION

Modes

Repeater Simulator, Mobile Simulator

Testing Results

Power, Frequency Error, RSSI, Deviation, SINAD, Audio Counter, Distortion

Protocol Trunking Message Elements

RIC, Home Channel, GOTO Channel, Group, Free Channel, Area, Border Bit, Received Data analysis in both repeater and radio simulation modes

Call Modes

Repeater Simulator: Idle, System Busy, Repeater Busy, Continuous Disconnect Radio Simulator: Idle, PTT Inverted Operation supported in both simulation modes

Configuration Bands

User, 800 MHz, 900 MHz

User Configurable RF parameters

Deviation

AUDIO FREQUENCY GENERATOR

WAVE SHAPE FORMATS

Wave Shapes

Sine, Square, Triangle, Ramp

AMPLITUDE

LEVEL

(FGEN 1 and 2 combined cannot exceed the following port limitations.)

Unbalanced

0 to 20 Vpp into 10 kΩ (Audio Out 1 [FGEN] and Audio Out 2 [DEMOD])

Balanced

High Range: 0 to 6 Vrms into 10 kΩ (Audio Out 1 [FGEN] only)

Low Range: 0 to 600 mVrms into 10 kΩ (Audio Out 1 [FGEN] only)

RESOLUTION

High Range

1 mV (Audio Out 1 [FGEN] and Audio Out 2 [DEMOD])

Low Range

0.10 mV (Audio Out 1 [FGEN] only)

ACCURACY (SINEWAVE)

Unbalanced (Audio 1 or 2, level >0.5 Vpp)

3% (20 Hz to 3 kHz)

Balanced

High Range: 10% (frequency at 1 kHz, level >0.5 Vpp)

Low Range: 10% (frequency at 1 kHz, level >0.05 Vpp)

Distortion (THD, Sinewave)

<0.5% (1 kHz, 3 Vpp)

<2% (20 Hz to 20 kHz, 1 through 15 Vpp)

FREQUENCY

RANGE

Unbalanced

DC to 20 kHz (Audio Out 1 [FGEN] and Audio Out 2 [DEMOD])

Balanced

50 Hz to 20 kHz (Audio Out 1 [FGEN] only)

Resolution

0.1 Hz

Accuracy

±1 Hz

TONE SIGNALING

DTMF, DCS, CTCSS, 5/6 Tone, Tone Remote

FILTERS

High Pass

300 Hz, 4 kHz

Low Pass

300 Hz, 4 Bessel kHz, 15 kHz, 20 kHz, 4 kHz LP Butterworth

Band Pass

300 Hz to 4 kHz

80 Hz and 3 kHz Narrow

APCO-25

SINAD

C-Weighted

BASE-BAND AUDIO FUNCTIONS

INPUT LEVEL RANGE

Audio In

200 mVpp to 20 Vpp

MIC In

10 mVpp to 1 Vpp

FREQUENCY RANGE

Unbalanced (10 kΩ Nominal)

Audio IN (SINAD) input - 50 Hz to 20 kHz

Balanced (600Ω Nominal)

Audio IN (SINAD) input - 50 Hz to 20 kHz

Mic (MIC) Input (10 kΩ Nominal)

50 Hz to 20 kHz (unbalanced)

AUDIO FREQUENCY COUNTER (DEMOD SELECTED)

Input Sources

Demodulated Audio, MIC Input, Audio (SINAD) Input

Ranges

200 Ω, 500 Ω, 1 kΩ, 2 kΩ, 5 kΩ, 10 kΩ, 20 kΩ

Accuracy

±1 Hz

Resolution

0.1 Hz

MICROPHONE AUDIO INPUT

Modes

Electret: +5 V through 5 kΩ Nominal

Dynamic

DVM FUNCTIONS

AC

Input Impedance

1 MΩ, 600 Ω, 150 Ω

Range

400 mV to 100 V in a 1, 2, 4 sequence

Resolution

0.1 mV (0.4 V scale), 1.0 mV (1, 2, 4 V scales), 10 mV (10, 20, 40 V scales), 100 mV (100 V scale)

Accuracy

6% of full scale (50 Hz to 20 kHz) ±1 LSB

DC

Range

400 mV to 100 V in a 1, 2, 4 sequence

Resolution

Same as AC

Accuracy

2% of full scale ±1 LSB

Input Impedance

10 MΩ Nominal

TIME BASE

Output Frequency

10 MHz

Time Base

±0.01 ppm stability; ±0.1 ppm/year aging

Output Level

1 to 5 Vpp into 10 kΩ

Warm-up

<5 minutes

DIGITAL I/O

Parallel Printer Port; Video Monitor Port (VGA); Mouse Port (PS2 compatible); Keyboard Port; Front Panel Test Port; 3.5 in. Floppy Drive

REMOTE COMMAND INTERFACE

RS-232, GPIB or TCP/IP (Ethernet) Remote Control Interface

For more specialized testing, the IFR 2975 can be programmed through the industry standard language TCL.

DISPLAY

Resolution

VGA

Height

99 mm, 3.9 in.

Width

131 mm, 5.15 in.

AC LINE

Power Requirements

100 to 120 VAC at 60 Hz

Max. Power 200 W at 120 VAC

220 to 240 VAC at 50 Hz

ENVIRONMENTAL/MECHANICAL

Weight

15 kg (33 lbs.)

Dimensions

356 mm wide, 197 mm high, 520 mm deep

14 in. wide, 7.75 in. high, 20.5 in. deep

Operating Temp Range

0° to 40°C

Storage Temp Range

-25° to 70°C

WARRANTY

2 years

Extended warranty available upon request

VERSIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers **Versions**

2975	Project 25 Radio Test Set

For the latest version of 2975 software please visit www.p25.com.

Options

Options

2975OPT3	SmartNet™/SmartZone™ VHF/UHF and 800 MHz
2975OPT4	P25 Trunking 800 MHz
2975OPT6	Control Channel Logger
2975OPT8	SmartNet™/SmartZone™ 900 MHz (Requires 2975OPT3)
2975OPT9	Autotest 1
2975OPT10	AES (Export Restricted)
2975OPT12	KVL Keyloader
2975OPT14	P25 Trunking VHF/UHF/700 MHz
2975OPT15	Audio Analyzer
2975OPT16	Analog Simulcast Align (Requires 2975OPT15)
2975OPT17	RX BER
2975OPT18	LTR® Trunking
2975OPT19	PassPort® (Requires Version 1.9.x or later Firmware)
2975OPT20	KVL ASN Mode (Requires 2975OPT12)
2975OPT21	P25 Secondary Control Channel Broadcast Message (Requires 2975OPT4)
2975OPT22	P25 Explicit Mode Operation (Requires 2975OPT 14)
2975OPT23	P25 Explicit Unit to Unit and PSTN Emulation (Requires 2975OPT22)
2975OPT24	P25 Explicit Adjacent Status Broadcast Channel Message (Requires 2975OPT22)
2975OPT29	CQPSK Generate/Receive and Analysis

Accessories

AC25007	Microphone\Audio Adapter*
AC25009PP	Maintenance Manual/Paper
AC25009CD	Maintenance Manual / CD-ROM
AC25011	Case, Transit W/Wheels
AC25012	Case, Soft Padded Carrying
AC25013	KIT, 10/20 db Pads, TNC
AC25014	Scope Probe Kit
AC25023	Front/Rear Cover*
AC25027	TNC to BNC Adapter*
AC25029	Accessory Pouch
AC25036	DC to AC Converter, 12VDC to 110-120VAC
AC25042	HF Antenna
AC25043	Antenna, UHF 450*
AC25044	800 MHz Antenna*
AC25045	Antenna, VHF 150*
AC4105	Return Loss Bridge (1.3 GHz)
CALFB2975	Calibration Certificate
W2975/201	Enhanced Standard Warranty
W2975/203	Warranty Extension one year (total warranty three years)
W2975/205	Warranty Extension three years (total warranty five years)
W2975/203C	Extended Standard Warranty 36 Months with scheduled calibration
W2975/205C	Extended Standard Warranty 60 Months with scheduled calibration

*Included as standard features

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.