SOFTWARE RELEASE INFORMATION

IFR 2975 Software Release Version 1.9.1.3 - Release Information 28 July 2005.

PURPOSE

The purpose of this document is to communicate the Feature/Function additions, operational changes, loading instructions, Operation Manual changes, and support contacts relating to the release of software for the IFR 2975 P25 Radio Test Set.

NEW FEATURES/FUNCTIONS

The latest version of IFR 2975 software is Version 1.9.1.3.

Below is a recap of recent version Features/Functions to highlight the on-going improvements to the IFR 2975.

Version 1.4.x Feature/Function Enhancements

- All the features/functions of Version 1.3.0
- New and improved IFR 2975 Operation Manual
- SmartNet™/SmartZone™ Trunking Option
- New SmartNet™/SmartZone™ Option Manual

Version 1.5.x Feature/Function Enhancements

- All the features/functions of Version 1.4.0
- EIA/TIA Standard P25 Modulation patterns, including CCITT V.52 pattern (TxBER)
- "Quick Tune" Spectrum Analyzer mode (use your mouse to click and tune signals)
- Newly revised IFR 2975 Operation Manual
- P25 Trunking Option
- New P25 Trunking Option Manual

Version 1.7.x Feature/Function Enhancements

- All the features/functions of Version 1.5.x
- New Spectrum Analyzer functions:
  - Four (4) Markers with frequency/level readout, plus marker-to-marker readouts
  - Cable Fault measurement calculator
  - "Quick Span" mouse for simultaneous frequency/span settings
- Digital Coded Squelch (DCS) and DTMF decoding
- Volume and Squelch controls are accessible using the mouse
- RF Generator ON/OFF control is on the Receiver screen
- A User definable screen permitting customized screens
- Faster Setup recall accessible from any screen
- Several bug fixes and enhancements

Version 1.7.x New Optional Features/Functions

P25 Options

- Control Channel Logger (2975OPT6) for capturing P25 trunking protocol messages
- LSM/P25 Phase II (2975OPT11) for Transmit and Receive of CQPSK waveforms
- LSM Advanced/P25-2 Advanced (2975OPT13) adds powerful measurement capabilities for P25 waveforms, including error vector magnitude (EVM) and I-Q constellation display
- P25 Trunking VHF/UHF/700MHz (2975OPT14) for testing P25 systems in various frequency bands of operation
- SmartNet™/SmartZone™ 900 MHz (2975OPT8) for testing radios in the 900 MHz band using this trunking protocol

Version 1.7.x New Optional Features/Functions (cont)

Encryption Options

- AES (2975OPT10) Advanced Encryption System to permit testing radios using this powerful encryption scheme
- KVL Keyloader (2975OPT12) to permit loading and management of encryption keys within the IFR 2975

Auto Test

- Autotest 2 (2975OPT9) provides automatic test and capture of test results for user defined analog and P25 conventional digital tests

Version 1.8.x Feature/Function Enhancements

- All the features/functions of Version 1.7.x
- New Spectrum Analyzer functions:
  - Eight (8) Markers with frequency / level readout, with marker-to-marker readouts, plus horizontal or vertical placement
  - Faster sweep speeds and enhanced zero span operation which allows the capture of the power ramp of power down ramp signal
- Auto-tune functions:
  - Provides the ability to automatically tune to a transmitter frequency and display spectrum, received frequency and frequency error
  - Provides the ability to perform automatic harmonic analysis
- Enhanced Web Features:
  - Expanded network IP now supports DHCP, providing streaming data via the Internet
  - Allows the user to manipulate files into the IFR 2975 via a web based file management system
- E-Manual Support:
  - This new feature provides the ability to create user manuals and application notes for display on the IFR 2975 User screen
  - Users have the ability to load the user manual and "how to" guides into the IFR 2975
- Enhanced P25 functionality, including,
  - Wider frequency error capture range for P25 radios (more forgiving for radios that are off-frequency)
  - C4FM modulation fidelity meter displays frequency error and deviation at symbol time in addition to the modulation fidelity reading
  - Rx BER function added to permit stimulus / response of P25 radios with support for four standard test patterns
  - LCO #7 (telephone number dialing) support
  - Op-codes "03" and "06" now have continuous delivery
  - Tx BER is a new standard feature which allows the user to measure modulator Bit Error Rate (BER) when transmitting a specific tone into the IFR 2975
- Function Generator adds Arbitrary and SINC waveform capability
- RF Generator microphone press-to-talk (PTT) control added
- Audio Route controls added for the MODULATOR loopback
- Demod Audio filter selection added for APCO-25
- AM PEP Power Meter: This enhancement allows the IFR 2975 to support Peak Envelope Power on AM measurements

<u>Version 1.8.x Feature/Function Enhancements</u> (cont)

- Deviation Meter and AM% Meter have added functionality for Peak, Average, Positive Peak and Negative Peak
- New SAVE / RECALL screen with directories support and new user interface for easier access to stored setups

<u>Version 1.8.x New Optional Features/Functions</u>

Audio Analyzer

- Audio Analyzer Option (2975OPT15)
  - 0 to 40 kHz Audio FFT Analyzer with Stimulus Signal to generate pseudo-random bandwidth, limited noise and sine(x)/x (sinc) for audio system performance
  - Six (6) Markers for measuring signal levels
- Analog Simulcast Align Option (2975OPT16) extends the test capability of the Audio Analyzer Option for test and alignment of Motorola base stations

P25

- Rx BER Option (2975OPT17) extends the BER function within the 2975 by adding external data input through the front panel Test Connector (data from radio under test)
- LSM / P25 Phase II (2975OPT11) has been extended to generate P25 LSM waveform (12.5 kHz BW) in addition to the P25 Phase II waveform (6.25 kHz BW)

LTR Trunking

- LTR Trunking Option (2975OPT18) for testing radios utilizing the LTR trunking protocol

- Repeater Test Application is set for alignment of Analog Simulcast systems using a low-end frequency balance from 0 to 100 Hz

<u>Version 1.8.2 Features/Functions Enhancements</u>

- All the features/functions of Version 1.8.x
- Addition of fast access to Keyloader functions on the Downlink P25 data tile
- Ability to turn Volume/Squelch slider ON/OFF
- Improvements to Autotest (2975OPT9)
- Addition of selectable notch frequencies to the SINAD and DISTORTION meters
  - Allows SINAD measurements at audio frequencies from 0 to 40 kHz
  - Allows user the option of using Kaiser filtering on audio path
  - Allows user the ability to specify the upper and lower noise bands and the upper and lower signal bands
- Improvement in Audio Analyzer functionality
- Enhancements designed to improve Remote command functionality, Remote Display Operation and system stability over time

<u>Version 1.8.2 Optional Features/Functions</u>

- ASN KVL Support (2975OPT20) is a legacy Keyloader mode used with KVL-3000 and older model Keyloaders from Motorola

<u>Version 1.8.2.1 Release Notes</u>

Version 1.8.2.1 includes fixes for minor issues noted in release 1.8.2. The fixes included in Version 1.8.2.1 are as follows:

- A fix to the *.rst command for remote operation and programming
- A fix to the CH1/CH2 Scope input sweep lock issue
- A fix to restore Scope Softkey functions
- A fix to entry errors on the HEX fields
- A fix to the Web Server file download issue
- A refinement of CH1/CH2 user selection when in maximized view
- Enhanced hot swap Ethernet cable function

<u>Version 1.8.2.2 Release Notes</u>

Version 1.8.2.2 includes fixes for minor issues noted in release 1.8.2. The fix included in Version 1.8.2.2 is as follows:

- A fix to the Fixed Mode of IP Operation

<u>Version 1.9.1 Features/Functions Enhancements</u>

- All the features/functions of Version 1.8.2.2.
- Scope Markers for the integral dual channel oscilloscope which allow users to set and verify amplitude and frequency parameters of audio signals ≤ 50 kHz.
- Screen Capture Function allows users to capture spectrum displays, oscilloscope displays, or any front screen display using the front panel HOLD key or via the 2975 standard web-server. In addition, with the integral web-server file management function, users can catalog graphic files and extract screen shots in a easy to use GIF format.
- In addition to Vpp, software version 1.9.1 includes the ability to select Vrms on sine waves generated from the function generator audio outputs.
- Demod Audio Routing Generator allows users to recover demodulated audio from AM, FM or P25 radio systems and use that audio to modulate either an AM, FM or P25 carrier. This capability provides for psuedo-repeater operation for extended test capabilities in bench and field operations.
- Ability to automatically receive, demodulate and calculate BER from a STD511 tone to assist in tuning various transmitters deployed in the market.
- Frequency lists are now optional when creating setups. Users have the option to attach frequency lists to file setups, speeding up the setup save and recall functions.
- Addition of Tracking Generator to the Audio Analyzer functions for sweeping audio circuits. Option improvement of 2975OPT15 and 2975OPT16.
- DTMF Decoder now provides a "Clear" function for clearing existing DTMF data.

Version 1.9.1 Optional Features/Functions

Passport

- The 2975 now optionally provides the latest features for testing Passport Radios and Repeaters. Version 1.9.1 includes deployment of the new VHF Passport Option (2975OPT19).

Explicit Messaging

- The 2975 now optionally supports explicit messaging for trunked VHF/UHF radio systems that use this extended messaging for the latest P25 trunking systems. This feature is available as 2975OPT22.

SCCB Messaging

- The 2975 now optionally 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. The explicit mode supports one additional control channel and the implicit mode supports two additional control channels. This is feature is available as 2975OPT21.

Adjacent Status Broadcast Messaging

- The 2975 now optionally 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. This feature is available as 2975OPT24.

Unit to Unit and PSTN Interconnect

- The 2975 now optionally 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. This feature is available as 2975OPT23.

Version 1.9.1.2 Features/Functions Enhancements

- All the features/functions of Version 1.9.1.
- Find frequency functions would occasionally lock up unit. This has been resolved.
- Scope operation over extended periods of time would occasionally lock up unit. This has been resolved.
- Redirect Function via Ethernet and X-Windows client would not properly display screens. This has been resolved.
- Minor bug fix in handling DHCP assignments.
- Added version control for option configurations.
- Set up files that incorporated a "Frequency List" could cause a unit lock up upon recall. This has been resolved.

Version 1.9.1.2 Optional Features and Functions

- Passport Option (OPT19) bandwidth setting was operating in the 12.5 kHz bandwidth when in fact the radio was assigned a 25 kHz wide bandwidth. This had been corrected.
- Added ability to log control channel and LCO messages for P25 operation (OPT6) to individual files with flexibility based on file size or time duration. These are remote commands only, no Graphical User Interface is provided.

Version 1.9.1.3 Feature/Function Enhancements

- All the features/functions of Version 1.9.1.2.
- Receiver squelch operation was not operating correctly. This has been resolved.
- Improvement in AM modulation meter accuracy.
- Improved C4FM Meter operation.

Version 1.9.1.3 Optional Features and Functions

- Minor fix on Passport VHF Band Channels 141-382 that were offset by 1 MHz
- Minor changes to VHF band operation.

NOTE: Passport Option owners must update their unit with the latest Passport Option file. Please call 1-800-835-2350 to request your updated Passport Option file for version 1.9.1.3.

OPERATIONAL DIFFERENCES FROM PRIOR RELEASES

Improvements within the IFR 2975 have been implemented for user interface and for new software options. To permit addition of the new software, additional memory may be required to older IFR 2975 units.

This release of software is compatible with version 1.3.0 and higher calibration (upgrade does not require IFR 2975 re-calibration).

If upgrading from version 1.5.2 and earlier, you must first upgrade to version 1.7.0 BEFORE you upgrade to version 1.8.2 and later versions.

This release may NOT be compatible with SETUP functions from prior versions of software due to additional functions and capabilities. SETUP functions require re-setup and re-save after Version 1.7.0 is installed. It is recommended that you document each setup currently in the IFR 2975, then delete each setup prior to installing version 1.7.0.

IFR 2975 units with Version 1.1.0 (or earlier) require additional memory to operate the latest version. This requires the units to be returned to an authorized service center to have the additional memory added.

DO NOT install latest version into 1.1.0 or earlier if the additional memory has not been installed. Contact Aeroflex if you have any questions about the memory within the IFR 2975 (Contact Information is located at the end of this document).

The software options require the customer purchase the option and install a license file into the IFR 2975 specific to the serial number.

If a version unit is updated in the field (not returned to service center), the 9-digit serial number must be entered prior to installing the license file.

For instructions about adding software options, refer to the appropriate Option Manual.

SOFTWARE FLOPPY BUILDER INSTRUCTIONS

The program "V1_9_1.exe" will make floppy disks for loading the IFR 2975 with version 1.9.1.3 software. The floppy builder program requires seven (7) blank floppy disks and a PC running Windows^{TM}.

To reload the IFR 2975:

1) Remove any disk from your computer's floppy drive.

2) Run the program "V1_9_1.exe." The WinZip self-extracting archive window appears with the text "Extract IFR 2975 V1.9.1.3 Install floppy creator?" Click on the OK button to extract the program and start the creation of the disks.

3) After the program has extracted itself, a window is displayed:

   Clicking [Close] aborts this process.

   Clicking [Start] begins the process.

4) A prompt appears to insert a floppy disk. THIS DISK WILL BE FORMATTED, AND ANY DATA ON IT DESTROYED! It is recommended that you use new, fresh floppies.

5) The "format disk" menu is displayed. This menu varies slightly between versions of Windows^{TM}. Select either "Quick Format" or "Full Format" and format the disk. (You can probably just accept the defaults as shown.) Most versions of Windows^{TM} asks you one last time to confirm you want to format the disk.

6) When the format is done, click on the "CLOSE" (or "DONE") button.

7) The program starts writing the first disk's data to the floppy. Now might be a good time to make a paper label for the disk (something like "IFR 2975 V1.9.1.3 Disk 1 of 10").

8) When the copy is complete, a prompt appears to remove and label the disk.

9) Repeat Steps 5 through 8 for all disks. Eventually, the program stops prompting for more disks and shows "Status: done." You may now close the window.

10) Power the IFR 2975 ON.

11) Go to the Software RELOAD screen by pressing **MODE**, **7**, **4** on the IFR 2975 keypad.

12) Insert disk #1 into the IFR 2975 floppy drive.

13) Press the "Check floppy" soft key. The IFR 2975 should access the floppy (the light on the floppy drive comes on) and a message "Copying update file to hard drive" appears. Shortly thereafter, the message "System update now at /usr/reload/reload.tar.gz" appears.

14) Press the "Reload System" button. A big red warning appears. Press the "Start Install" button. Very quickly, a window appears stating:

   Loading sections from floppy

   Loading disk 1

   [CANCEL [F6]]

   The unit now starts reading the parts of the reload file from the disk. THIS TAKES A WHILE, PLEASE BE PATIENT.

   Eventually, the window changes to:

   Loading sections from floppy

   Loading disk 1

   Please insert disk 2

   [CONTINUE [F1]] [CANCEL [F6]]

SOFTWARE FLOPPY BUILDER INSTRUCTIONS (cont)

15) Remove the disk and insert the next disk. Press the "Start Install" soft key. The window changes to:

> Loading sections from floppy
>
> Loading disk 2
>
> [CANCEL [F6]]

Repeat Step 15 until all disks have been loaded into the IFR 2975.

THE SOFTWARE IS NOT INSTALLED YET! KEEP GOING!

The software now begins to install on the IFR 2975. PLEASE BE PATIENT, THIS TAKES APPROXIMATELY 20 MINUTES. When all four status bars are completely blue and the message "System Firmware Update Installation is Done" appears at the bottom of the screen, turn the unit OFF by pressing the POWER button.

Wait a moment, remove any floppy disks within the unit and then turn the IFR 2975 back ON. You can check the latest version of software is installed by going to the VERSION screen (**MODE**, **7**, **3**).

Finally, press **MODE**, **7**, **1** to select the CONFIGURATION screen and press the FACTORY DEFAULT softkey. The IFR 2975 is now ready for use.

IFR 2975 OPERATION MANUAL

The IFR 2975 Radio Test Set Operation Manual is available to describe basic features and operational parameters. A PDF format of the latest Operation Manual is available on our web site (*http://www.p25.com*).

The Manual for Remote Interface for the IFR 2975 is available on our web site (*http://www.p25.com*).

The Option Manual for the IFR 2975 SmartNet™ /SmartZone™ capability is available on our web site (*http://www.p25.com*).

The Option Manual for the IFR 2975 P25 Trunking capability is available on our web site (*http://www.p25.com*).

The Option Manual for the IFR 2975 LTR® capability is available on our web site

(*http://www.p25.com*).

The Option Manual for the IFR 2975 PassPort® capability is available on our web site

(*http://www.p25.com*).

IFR 2975 APPLICATION INFORMATION

Application notes for the IFR 2975 are available on our web site (*http://www.p25.com*).

AEROFLEX CONTACT INFORMATION

Additional on-line information is available regarding the IFR 2975:

http://www.p25.com

For issues related to software or options, contact Aeroflex Sales Support:

Aeroflex
Sales Support Department
10200 West York Street
Wichita, Kansas 67215

Telephone: (800) 835-2352 (Option 4)
FAX: (316) 524-2623
Email: techsupport@aeroflex.com

For issues related to hardware upgrades, contact Aeroflex Customer Service:

Aeroflex
Customer Service Department
10200 West York Street
Wichita, Kansas 67215

Telephone: (800) 835-2350
FAX: (316) 524-2623
Email: service@aeroflex.com

On-line Return Authorization is available at:

http://www.aeroflex.com/services/rma.htm