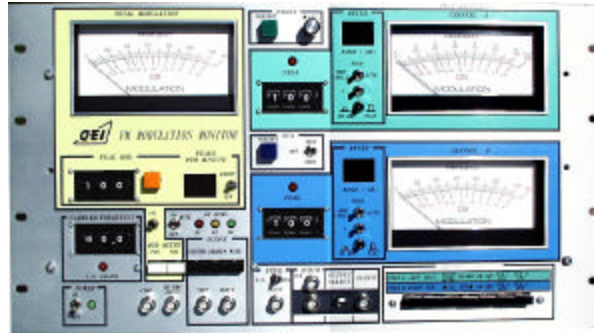




691 Stereo Modulation Monitor and Test Set



General

The 691 FM Modulation Monitor/Test Set is a high technology, precision instrument employing a combination of new techniques in a single, highly versatile, but very compact package. It has been designed to be a complete FM test package with facilities for all proof-of-performance measurements and a wide range of trouble-shooting tests. Operator convenience and simplicity of use were primary considerations in the design of the 691. Component selection and device ratings are such as to enhance the instrument's reliability even with adverse handling. The 691 occupies only 10-1/2" of vertical rack space in a standard 19" rack.

Front panel Convenience

A color coded grouping system ties together the associated meters, switches, indicators and jacks for a particular test or function. This coupled with the auto-ranging metering and front panel indicators minimize operator error. Adding to these ease-of-operation features is the simple but effective device of mounting the L and R meters vertically thus eliminating the "Ping-Pong" type of eye movements necessary for horizontally mounted meters. Both the 691's meters are easily tracked in a single glance.

Easy-to-Operate

In addition to the functional color coding a number of features are incorporated into the 691 that simplify operation and maximize accuracy. The RF input level is monitored and the signal level displayed by 3 LED's (HI-LO-OK). Calibration can be verified from the front panel. A single row of push-buttons simultaneously select both A and B displays of the two auto-ranging meters. All primary test outputs are available on the front panel (BNC jacks). The signal inputs and secondary outputs are located on the rear panel. Color coded lamps indicate pilot and/or sub-carrier presence. A warning LED illuminates should the local oscillator become unlocked.

Features

- **A Complete proof-of-performance instrument for Mono, stereo and SCA measurements**
- **Tunable in 100 kHz steps over the entire FM band**
- **Auto-ranging meters select correct meter operating range automatically**
- **Converts a standard X-Y oscilloscope into a spectrum analyzer for occupied bandwidth observations**
- **off-the-air or direct transmitter connection**
- **will accept up to 50 Watts of RF input with a suitable load termination**
- **functional front panel layout with color coded groupings and unique over-under meter arrangement**
- **Extremely low internal distortion**
- **peak flasher adjustable from 1% to 199% with digitally displayed peaks per minute**
- **Vector Display of stereo phasing with standard oscilloscope**
- **Composite input allows direct measurement of the STL receiver, stereo or SCA generator output**
- **over forty proof-of-performance and trouble-shooting tests possible when used with an oscilloscope**
- **Built-in modulation calibrator**
- **Built-in Bessel null feature allows field calibration verification**
- **Full one year warranty on all parts and labor**

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Technical Specifications

The operating frequency and peak flashers are set by use of rugged thumb wheel switches to assure positive contact and minimize setting error.

Monitor Pilot phase may be matched to stereo generator pilot phase in the presence of modulation.

TEST SET FLEXIBILITY

The built-in signal sampler allows the 691 to function as a self-contained exciter test set. Any exciter of less than 50 watts output may be directly connected to the RF input thereby eliminating the requirement and expense of external signal samplers. All required frequency outputs are available at a single (switch selectable) front panel BNC connector.

The front panel outputs of the test meters allow quick and easy oscilloscope-comparison of channel A and channel B content when making separation, crosstalk, or noise measurements.

The null setting for stereo generator (19 kHz-38 kHz) phase increases accuracy and reduces test equipment set up time.

FM noise and AM noise measurements are made automatically without the need to preset reference levels.

The 691 comes complete with a six element yagi antenna for off-air monitoring eliminating the need for an additional amplifier.

AUTORANGING TEST METERS

A "display-select" row of push-buttons choose seven (7) pair of different tests (14 total) to be displayed by the Auto-ranging Meters. Channel A is displayed on the upper meter while channel B is displayed on the meter directly below it. Channel A and B meters will automatically select and indicate in the correct operating range for the level of signal under test. The operating range and unit of measurement is displayed directly to the left of its respective meter. The meters are individually selectable to display either positive or negative peaks.

The autoranging feature can be defeated by a front panel switch which allows the meter to function with the ballistics specified by the FCC when these types of measurements are required. The de-emphasis network can be activated by a push-button switch conveniently placed to the left of the meter.

AM noise and FM noise measurements automatically activate the de-emphasis network.

SPECTRUM ANALYZER AND VECTOR DISPLAY

The 691 provides two BNC jacks for X-Y connection to an oscilloscope (not supplied with 691). A front panel push-button selector enables the operator to view the occupied bandwidth of the transmitters signal with either a 240 kHz or 700 kHz display. The 240 kHz (narrow) spectrum analyzer display allows the operator to use *bessel null* functions to determine the **absolute calibration accuracy** of the 691 Monitor/Test Set.

Additionally the phase relationship between the left and right channels may also be viewed on the oscilloscope as a vector display. This simplifies stereo phase adjustment and allows continuous monitoring of the phase relationship of an off-the-air signal.

PEAK FLASHERS AND COUNTERS

The total modulation flasher illuminates each time the level of modulation exceeds a pre-determined level (adjustable from 0 to 199%). The total modulation peaks exceeding this level in a one minute period are counted and displayed. LED peak flashers, also adjustable, are used for channel A and B displays.

Available as a low cost option is the Variable Peak Detection card, which allows the end user to select the peak weighting (interval) and number of peaks within a specified time period.

PERFORMANCE SPECIFICATIONS

RF Frequency Range:..... 88.1 - 107.9 MHz (thumb wheel selected)

RF Input:

Antenna..... 3.16mv to 80mv
Signal Sample..... 1mW to 50W (depending on external load)

Total Modulation Display (Modulation Monitor):

Accuracy..... + or - 2% entire range
Frequency Response..... 0.2 dB 30 Hz - 75 kHz
Range..... 0-133% (-20 dB to +2 dB)
Ballistics..... per FCC regulations

Peak Indicators:

Range..... 0-199% in 1% increments
Accuracy..... + or - 1%

Peak Counter:

Set Point..... 0-199% + or - 1%
Time..... 1 minute + or - 1 sec

Distortion (monaural):

S/N..... better than 75 dB (with 75 usec de-emphasis)

Distortion (Left /Right):

THD..... 0.05%
IMD..... 1% (50 Hz to 5 kHz)
SCA (4 kHz dev.)..... 1% (50 Hz to 5 kHz 150 usec de-emphasis)

Test Displays (2):

Meter Accuracy..... + or - 2% entire range
Peak Indicator accuracy..... + or - 1%
Pilot & SCA Injection Accuracy..... + or - 0.5% (6% to 12%)

Separation:

L into R or R into L..... 55 dB

Crosstalk:

Main into Sub..... 65 dB
Sub into Main..... 65 dB
SCA into Sub or Main..... 70 dB
Pilot into Sub or Main..... 70 dB

Monitoring Modes:

Left/Right, Main/Sub, Pilot Level/Phase Cal., 38 kHz/Gen. Phase, FM S/N/AM S/N, SCA Inj. #1/SCA Mod. #1, SCA Inj. #2/SCA Mod. #2.

Outputs:

Left..... 600 ohms balanced and high-Z
Right..... 600 ohms balanced and high-Z
Scope..... 1 V_{P-P}
Frequency..... X.O, I.F., Pilot, SCA

Spectrum Analyzer Output:

X (horizontal)..... 4 V_{P-P}
Y (vertical)..... 0.5 V/10 dB

MECHANICAL

Dimensions:

Monitor..... 10.5" H x 19" W x 12" D (26.7 x 48.3 x 30.5 cm)
Antenna..... 3" H x 6" W x 64" L (7.6 x 15.2 x 162.6 cm)

Shipping Weight:

Monitor..... 32 lbs. (14.54 kg.)
Antenna..... 5 lbs. (2.27 kg.)

Maximum Operating Temperature:..... 122°F (50°C) ambient

OPTIONS

Built In SCA Monitoring:

Single SCA..... 691/01
Dual SCA..... 691/02

Variable Peak Duration Test Option..... VPDTO