



FEATURES

- Interfaces with the MSR-904A Receiver
- .03-40 GHz Operation
- IEEE-488 Interface
- Synthesized Marker Accuracy
- RFI Shielded
- Auto-Stop
- Optional Remote Tuner
- 100 Hz Resolution Standard Feature (Previously Option 1)

DESCRIPTION

The FCS-904 Frequency Counter/Synthesizer is a companion unit to the MSR-904A Microwave Receiver. It controls the frequency of the MSR-904A and acts as an interface between the IEEE-488 Interface Bus and the MSR-904A. Sophisticated microprocessor algorithms enable the FCS-904 to perform tasks which greatly reduce the requirements placed on the user and increase system operational speed.

CW MODE

In the CW mode, the frequency displayed is the receiver center frequency. The receiver LO is sampled by the FCS and the calculations for the IF offset and other "housekeeping" functions are handled by an internal microprocessor. The user can program three separate frequencies via three separate keys on the front panel and recall any of these frequencies with ease. Each of these frequencies can be

programmed by a front panel keypad, an optical encoder which provides "analog endless tuning", or the IEEE-488 Interface Bus.

The "first" CW key may be programmed as previously described, but also is automatically set to the frequency of the marker when the unit is switched from the "LIN SWP" mode to the "CW" mode. This capability allows a user to align the "Synthesized Marker" with a received signal, then switch to "CW" and see the signal within the passband of the receiver without additional tuning.

SYNTHESIZED SWEEP

The Synthesized Sweep mode is straight forward with the start and stop frequencies plus the step size and dwell time programmable. This mode is very useful for small sweep frequency segments and for communications bands with fixed

frequency channels. The user can step through the channels and automatically be tuned to the center of each channel.

LINEAR SWEEP MODE

In the "LIN SWP" mode, sweep limits, marker frequency and sweep speed are all programmed via the FCS-904. The FCS-904 controls the MSR-904A receiver frequency as an analog controller with frequency limit accuracies of approximately .5%. The marker frequency is derived using synthesis techniques, thus resulting in near crystal accuracy. When an external display is used and the marker is tuned to a received signal and then switched to CW, the signal will be within the passband of the receiver without additional tuning. The marker or CW frequency can be recalled by an IEEE-488 (GPIB) controller as well as being displayed on the front panel of the FCS-904.

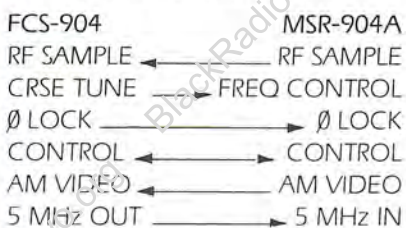
A particularly interesting function can be implemented in this mode of operation. A signal level threshold can be set via either the IEEE-488 interface or FCS-904 front panel. When a signal is detected which exceeds the threshold level, the internal micro-processor performs according to a special algorithm to use the synthesis capability of the FCS-904

to fulfill a counting function. The center frequency of the signal is displayed on the FCS-904 display and made available to the IEEE-488 Bus. The IEEE-488 service request (SRQ) is set to signal an external controller. The controller reads the data outputted from the FCS-904 and then notifies the FCS-904 to continue sweeping.

When operated manually, the Auto-Stop dwell time can also be programmed via the front panel controls.

INTERFACES

The FCS-904 interfaces to the MSR-904A receiver as follows:



Additional interfaces include an RS-232 serial interface, Marker Output and Blanking Output which connect to a DC-904 Digitally Refreshed Display. The RS-232 interface transfers alphanumeric information from the FCS to the DC-904. An IEEE-488 interface bus is standard.

OPTION 4

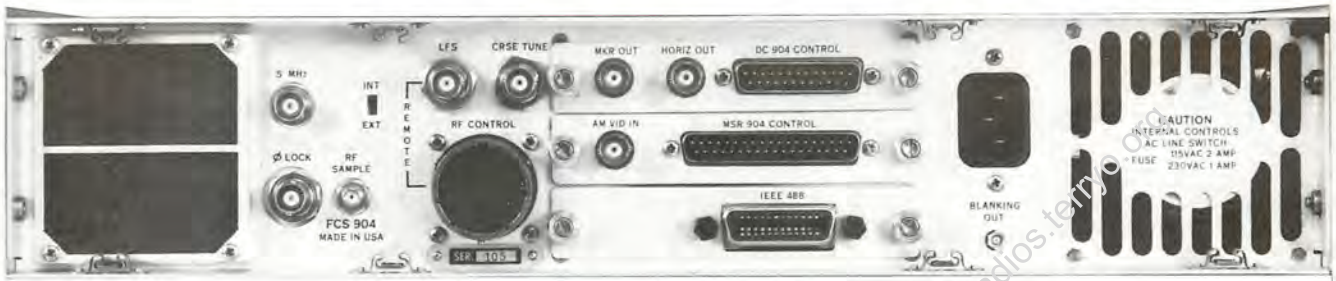
The RF section of the FCS-904 is housed in a removable tuner which can be removed up to 200 feet along with the remote tuner of the MSR-904A. This enables the user to have ready access to the instrument controls while the microwave componentry is placed close to an antenna, thus greatly reducing the signal attenuation due to cable loss.

This option includes a heat sink and the internal cables which replace the RF tuner when it is removed.

NOTES

SPECIFICATIONS

Frequency Range03-18 GHz Standard .03-40 GHz when operating with an MSR-904A and FE-904 Extender (18-40 GHz)
Frequency Stability	3 x 10 ⁻⁹ /24 Hr. Standard 1 x 10 ⁻¹⁰ /SEC
Marker Accuracy	1 MHz
Frequency Resolution	100 Hz (.03-18 GHz) 10 KHz (18-40 GHz)
Incidental FM (Synthesized)	100 Hz RMS Max
Switching Time	50 ms Max
Display	16 Character Alphanumeric
Tuning	Front Panel Keyboard GPIB Optical Encoder
Temperature (°C)	0 to 50 Operating
AC Power	115/230 VAC ±10% 50-60 Hz
Size (Inches)	3½ x 17 x 21½
Weight (Pounds)	35



ORDERING INFORMATION (Please see latest price list.)

**FCS-904
Frequency/Counter
Synthesizer**
.03-40 GHz
(MSR-904A must have
Option 2-LO Sample)

- Option 4 Remote Tuner Operation
- RCC-1000 Cable for Remote Tuner Operation (up to 200 ft.)
- C-904 Carrying Case

**MSR-904A
Microwave Surveillance
Receiver**
.5-18 GHz Includes
Digital Control, Automatic
Bandswitching, Pan CRT,
21.4 MHz (Previously
Option 4A), and
AUTO-STOP (Previously
Option 7).

- Option 2 Lo sample for Synthesizers or Counters
- Option 3 Low Frequency Coverage—.03 to 500 MHz
- Option 4B 160 MHz IF Output phase lockable with synthesizer
- Option 4C 70 MHz IF Output—phase lockable with synthesizer
- Option 5 Special IF Bandwidths—Contact Factory
- Option 6 IF Reference—Measure RF Amplitude to 1 dB with calibration chart
- Option 8 Provision for 18-40 GHz

**FE-904K/KA
Frequency Extender**
18-40 GHz

- Option 1 Pre-Selection
- Option 2 LO SAMPLE (Required for FCS-904/FS-1000 Operation)
- Option 3 Waveguide Input 18-26.5 GHz

**DC-904
Digitally Refreshed CRT**

- Option 1 160 MHz SDU Display (Requires MSR-904A Option 4B - 160 MHz IF)

WARRANTY

All Micro-Tel products are unconditionally warranted for a period of one year except for physical damage, provided the equipment is returned to the plant in Hunt Valley.

DISCLAIMER

Micro-Tel produces computer-controlled systems to support the Test and Measurement industry and the surveillance market as well. Demonstration software is produced to support these systems and is provided at no cost to our customers. This software is supplied to assist our customers in developing their own software. Micro-Tel does not warrant the software to meet any specific needs or requirements and is not responsible for improving existing software.