



**MICROWAVE
RADIO** corporation

The Microwave Connection

MR-23VX 23 GHz Microwave System for Video Transmission

Features

- One or two-way transmission of video signals
- Up to two simplex or duplex subcarriers for audio or data applications
- RS-232 or RS-422 data subcarrier
- 1-foot or 2-foot antenna standard
- Optional 4-foot antenna available
- Built-in diagnostics with front panel indicators for easy servicing
- Easy installation and alignment
- Full compliance with SIA warranty and service practices



The MR-23VX is an economical solution for the short-range transmission of video signals. It features a variety of options that let you customize your system for surveillance, CCTV, teleconferencing, or studio-to-transmitter links.

Microwave is a less expensive alternative to cable, eliminating not only cable's prohibitive installation costs, but also the delays encountered in obtaining construction permits. It is also a good solution where cable is impractical: congested downtown areas, across highways or landscaped grounds, or locations where trenching and aerial lines are not permitted.

FLEXIBLE DESIGN

The modular design of the 23VX lets you create the exact system you need, with one or two-way transmission of selected subcarriers.

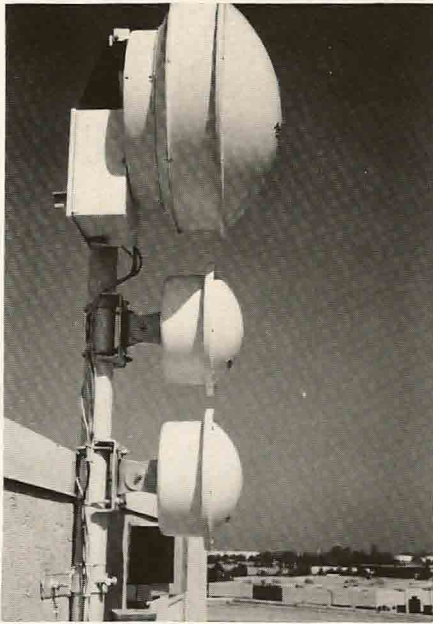
The simplex system carries video and subcarrier signals in one direction only, and is suitable for simple surveillance or STL use.

The duplex system carries the signal (either video, subcarrier, or both) in two directions, and gives greater flexibility for security and teleconferencing applications. For example, a simple duplex system could carry video in one direction and camera controls in reverse; a more complex system could carry video, controls, and audio in both directions.

Up to two subcarriers may be used to carry audio, RS-422 data, or RS-232 data. These may be used for intercom, camera controls, telephone or facsimile channels.

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The one-foot antenna is ideal for most "campus" style locations, where distances covered are 3 to 5 miles. A two-foot antenna may be substituted for coverage of 5 to 8 miles, and an optional four-foot antenna for special applications is available which will cover 8 to 12 miles.

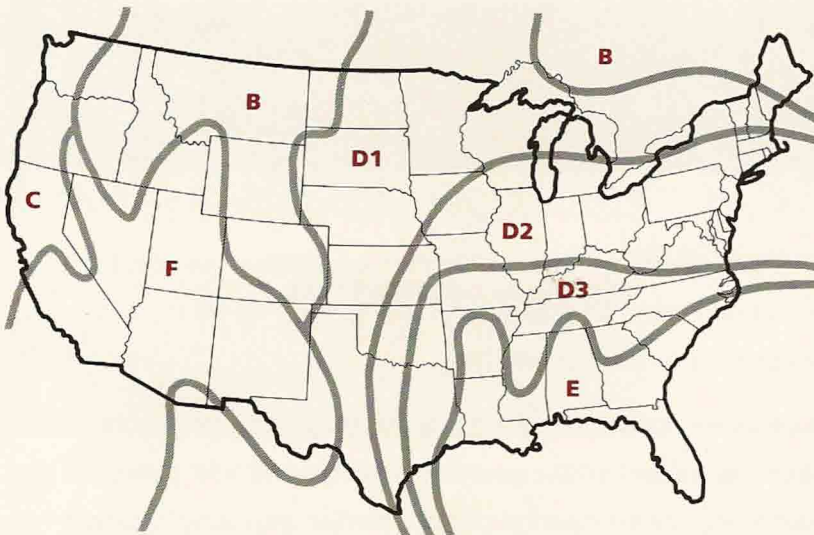
SYSTEM DESIGN

The MR-23VX consists of a weather-resistant RF unit with integral antenna and rack-mounted indoor interface unit. All video and subcarrier connections are conveniently located on the rear panel of the controller unit, which contains power supply and diagnostic circuitry. Status indicators on the front panel display system performance at a glance.

INSTALLATION

You can rely on a worry free installation of your 23VX. We'll help you choose the configuration that's right for you, and provide complete and clear instructions on installation.

Installation is easy: simply mount the radio, point, and turn it on. The interface unit can be rack-mounted as far as 250' from the antenna/RF unit. Only an adjustable wrench, screwdriver, and voltmeter are required to put in your own microwave link. Or, we can arrange to have the equipment installed for you—promptly and economically.



Typical outage per year (in minutes) caused by rainfall
One-foot Antenna

Path Length (Miles)	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0
Region B	5	5	5	5	9	16	21	43
Region C	5	5	8	13	24	42	47	84
Region D1	5	5	13	18	37	66	79	180
Region D2	5	8	18	37	66	116	142	300
Region D3	5	16	37	68	131	210	315	600
Region E	8	60	131	237	368	578	657	1077
Region F	5	5	5	8	16	29	37	63

Heavy rainfall affects the quality of the microwave signal as the distances covered increases. So a path suitable to an arid climate may be too great in areas where there are frequent downpours. The chart gives typical annual outages for different path lengths and areas of the country.

Typical outage per year (in minutes) caused by rainfall
Two-foot Antenna

Path Length (Miles)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
Region B	5	5	5	6	9	15	24	32
Region C	5	5	7	16	26	38	58	68
Region D1	5	5	9	21	42	66	105	137
Region D2	5	5	16	42	74	110	158	210
Region D3	5	9	32	79	131	210	368	468
Region E	5	32	116	263	394	578	736	893
Region F	5	5	5	11	17	26	39	53

SERVICE

The 23VX contains the same reliability that has been proven in thousands of installations worldwide, so you can count on your MRC microwave radio to deliver years of trouble-free service. However, if you should run into problems, we've made sure they won't last long.

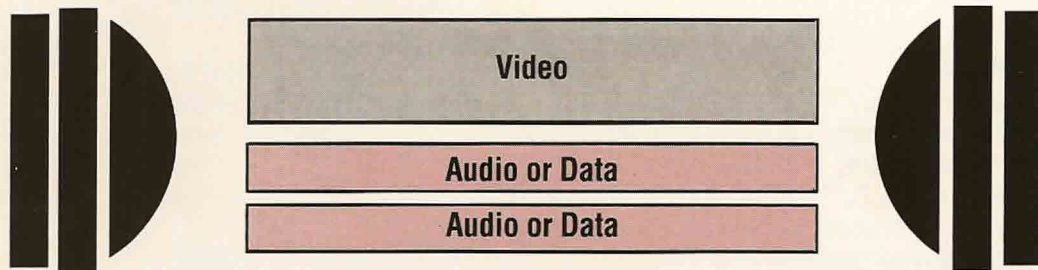
Diagnosis and service of most malfunctions is simple. The front panel features a two-function meter for AGC voltage, and Gunn current. LEDs verify that carrier, Gunn current, and power are working. Fuses are mounted directly on the back panel, so they can be changed without removing the interface unit from the rack.

If you cannot find the problem, we'll back you up with our factory-based customer service staff. Call us, and we can probably talk you through the repair.

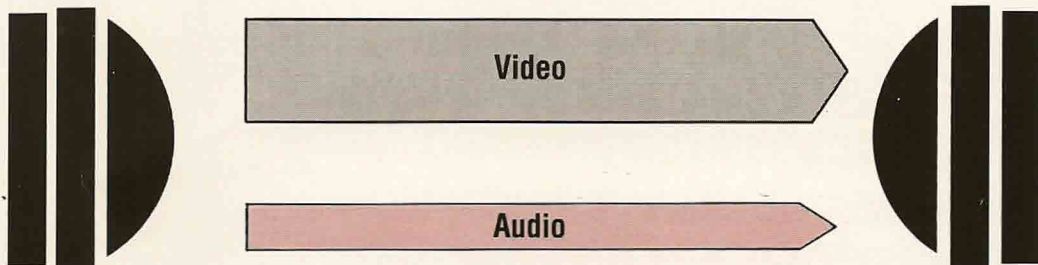
Our equipment is backed with a one-year warranty, and a guarantee of under 7 days for in-factory repairs. We maintain an extensive spare part inventory, so in most cases we can send you a replacement part within 24 hours.

TYPICAL CONFIGURATIONS

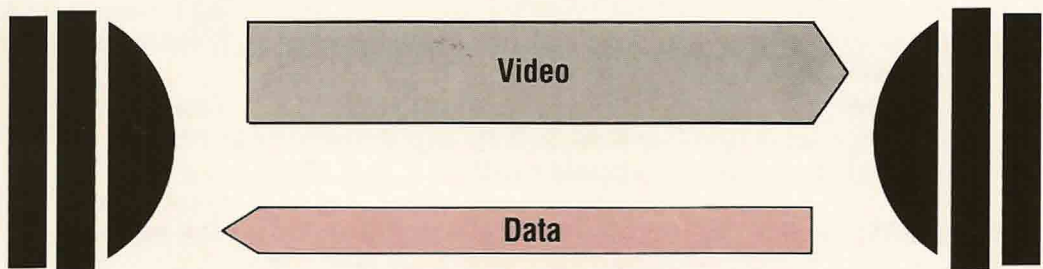
The 23VX delivers enough bandwidth to carry the video signal and up to two subcarriers, in simplex (one-way) or duplex (two-way) mode.



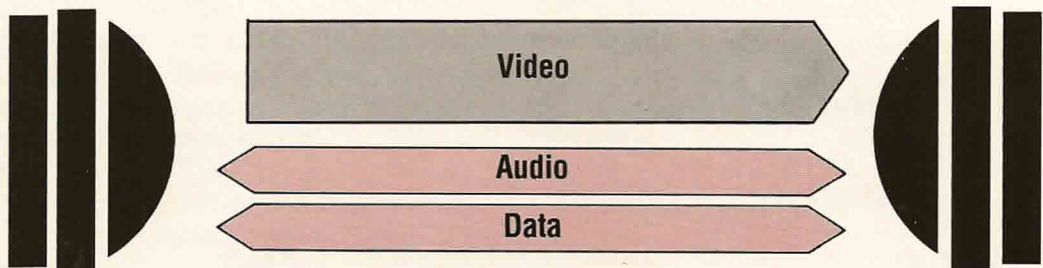
The simplex version allows both video and audio channels from camera/mic to a monitoring station.



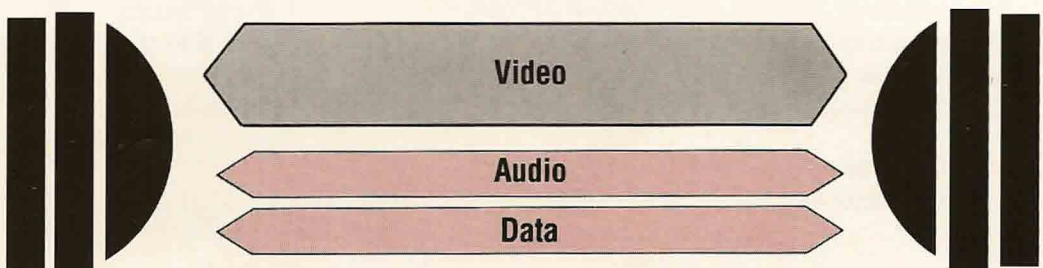
A common duplex installation with video from camera to monitor, and camera controls back from monitor to camera.



Simplex video with duplex audio and controls allow intercom, plus a data channel for camera controls with access controls on the return channel.



The most sophisticated 23VX configuration delivers full duplex performance on video, audio, and control channels, and is suitable for teleconferencing applications.



MR-23VX SPECIFICATIONS

GENERAL

Frequency Bands:
1' antenna systems: 21.8 to 22.0 GHz and 23 to 23.2 GHz
2' antenna systems: 21.2 to 23.6 GHz
Radio Capacity: MR-23VX 8 MHz bandwidth, 525/625 line video, plus up to two FM subcarriers for audio and/or data channels
Modulation: FM
Deviation: ± 4 MHz
Video Signal-to-Noise Ratio (with -35 dBm RCL): 55 dB minimum
Subcarrier Bandwidth: 15 KHz
RS232, RS422 Data Transmission with external modems: 19.2 Kbps

ANTENNA

Size: 1' diameter
Gain (including Radome Loss): 33 dBi
Beamwidth (3 dB): 3.5°
Size: 2' diameter
Gain: 40 dBi
Beamwidth (3 dB): 1.8°

PRIMARY POWER

Source: 115 Vac (50 to 60 Hz)
220 Vac optional
Power Consumption:
Transceiver (duplex systems): 140 W
Transmitter: 70 W
Receiver: 70 W
RF Unit powered via interconnection cable by Video Interface Unit

ENVIRONMENTAL

RF Unit:
Ambient Temperature:
Operational: -30 to +50°C
Storage: -40 to +60°C
Relative Humidity: up to 100%
Wind Load: 40 psi maximum
Video Interface Unit:
Ambient Temperature:
Operational: +10 to +40°C
Storage: -30 to +50°C
Relative Humidity: up to 95%

TRANSMITTER

Power Output (at O/P of source):
Minimum: 50 mW (+17 dBm)
Typical: 66 mW (+18 dBm)
Maximum: 100 mW (+20 dBm)
Long-Term Frequency Stability: $\pm 0.03\%$
Spurious Response: per FCC Part 94 and Part 21
Video Input:
Level: 1V P-P
Impedance: 75 ohms
Return Loss: 20 dB minimum

Audio and/or Data Input:
Level: 0 dBm
Impedance: 600 ohms, balanced
Connector: Pluggable Terminal Strip
Subcarrier Frequencies: 6.2, 6.8, or 7.5 MHz

RECEIVER

Type: dual conversion, superheterodyne
Noise Figure: 12 dB nominal
Local Oscillator: solid-state, Gunn oscillator
IF Bandwidth: 40 MHz
First IF Frequency: 140 MHz
Video Output:
Level: 1V P-P
Impedance: 75 ohms
Audio and/or Data Output:
Level: +9 dBm
Impedance: 600 ohms, balanced
Connector: Pluggable Terminal Strip
Receiver Threshold (37 dB weighted S/N): -71 dBm

PHYSICAL

Size (Transceiver, Transmitter, or Receiver):
RF Unit (including antenna): 16" (dia) x 10.75" (d)
(40.5 x 27.5 cm)
Video Interface Unit: 3.5" (h) x 19" (w) x 14.3" (d)
(9.0 x 43.2 x 36.3 cm)
Weight:
RF Unit (includes 1' dish): 10 lbs. (4.5 kg)
Video Interface Unit: 13.5 lbs. (6.1 kg)

VIDEO INTERFACE UNIT TO RF ASSEMBLY INTERCONNECTION

Recommended Configuration:
DC Power: 250 feet maximum of #18 AWG, 4-conductor, shielded wire
IF/BB: 250 feet maximum of TYPE RG-6/U coax cable, double shielded (braid and foil)
Technical Limits for Alternative Configuration:
DC Power: 2.9V maximum dc drop at 1.9A or 1.5 ohm total loop resistance

FCC DATA

Type Accepted: Parts 94 and 21
Emission Designator: 25MOF8W
Recommended Frequencies:
1' Antenna Systems: 21.925, 23.125, 21.975, 23.175 GHz
2' and 4' Antenna Systems: From 21.225 GHz to 23.575 GHz
FCC Identifier:
1' Antenna Systems: FC35DZMR23VX
2' and 4' Antenna Systems: FC35DZMR23VX-2

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