MODEMS, RECEIVERS AND RF/IF/BASEBAND PROCESSING SYSTEMS AND COMPONENTS

- Modems
- Switching Systems
- Receivers

MITEQ

ISO 9001

Modems

Switching Systems

Receivers

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AUDIO SUBCARRIER MODULATOR EXPANSION SYSTEM

MODEL ASM-100

The ASM-100 expansion audio subcarrier modulator system is a one-rack unit, capable of supporting up to two remote-programmable audio subcarrier modulators. This expands the total number of subcarriers supported by the VM-100R video modulator system to six. Expansion subcarrier modulators are locally and remotely programmable (see Option MRVA for VM-100R) via the VM-100R front panel and remote port, respectively. A special port is provided on both the VM-100R and the subcarrier modulator expansion systems for intra-system local communication.

SPECIFICATIONS

Number of subcarrier channels/systems ..... Up to two

AUDIO

Input level ..... +18 dBm maximum
Input impedance ..... 600 ohms balanced (others available)
Input return loss ..... 30 dB minimum
Frequency response ..... 100 Hz to 12 kHz, 0.6 dB p-p,
40 Hz to 15 kHz, < 1 dB p-p
Harmonic distortion ..... < 0.5%, 150 kHz p-p deviation,
< 1%, 840 kHz p-p deviation
Pre-emphasis ..... 50/75 µs, J17 and flat response switchable
Signal/noise (weighted) ..... > 62 dB, 300 kHz p-p deviation

SUBCARRIER MODULATOR

Subcarrier deviation by audio ..... Programmable from 25 to 420 kHz peak
(1 kHz programming resolution)
Subcarrier IF level ..... Programmable below the main IF carrier level from -35 to -13 dBc
(corresponding to < 2% to > 20% of IF deviation by video)
(0.1 dBc programming resolution)
Subcarrier pre-emphasis ..... 50/75 µs, J17 pre-emphasis or flat response selection
Subcarrier IF frequency ..... Programmable from 5 to 8.2 MHz (10 kHz programming resolution)
Subcarrier limit level ..... Programmable from 12 to 20 dBm (0.5 dBm programming resolution)

PRIMARY POWER REQUIREMENTS

Voltage ..... 100/120/220/240 VAC, ±10%, rear panel selectable
Frequency ..... 47 to 63 Hz
Power consumption ..... 20 W

PHYSICAL

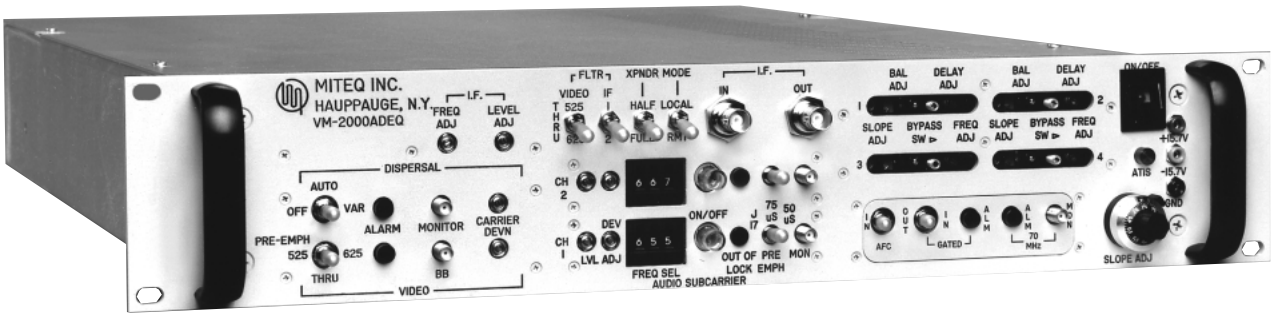
Dimensions ..... 19" x 24" x 1.75"
Weight ..... 11 pounds

CONNECTORS

Audio input ..... 8-pin DIN
Subcarrier output ..... BNC
Remote and local programming ..... 9-pin male, D type (to VM-100R modulator)
Contact closure ..... 9-pin male, D type
Chassis ground ..... 10-32 stud

HIGH-PERFORMANCE VIDEO/AUDIO MODULATOR WITH AMPLITUDE AND GROUP DELAY EQUALIZATION

MODEL VM-2000ADEQ
2 RU HEIGHT, 70 AND 140 MHz



The VM-2000ADEQ video modulator is designed for applications that require high signal-to-noise ratios and minimum distortions of the transmitted information, for both video and audio signals. The applications include multiloop terrestrial and satellite links where cumulative distortions render conventional modulator performance unacceptable. These modulators are designed to meet or exceed RS-250C short-haul and IESS-306 standards and are compatible with NTSC, PAL and SECAM video formats. A wide selection of optional features make the modulators compatible with B-MAC, D2-MAC, SIS, IRDETO and encrypted NTSC, PAL/SECAM video formats.

FEATURES

- Adaptable to a wide variety of video formats
- Satellite and system amplitude/group delay equalization
- Four stages of linear/parabolic group delay equalization, IF amplitude slope equalization
- DC-coupled circuitry
- Synthesized front panel, thumbwheel programmable audio subcarrier modulators
- Multiple pre-emphasis selection for video and audio
- Averaging AFC with enable/disable select
- Baseband, IF and subcarrier monitor ports
- Video present, dispersal failure, IF and subcarriers out-of-lock condition indicators
- Summary alarm
- One IF filter and one video filter of customer's choice
- Up to two audio subcarrier modulators programmable from 5 to 8.2 MHz in 10 kHz steps, supporting 50/75 µs and J17 audio pre-emphasis
- Up to two switchable IF filters
- Up to two switchable video filters

OPTIONS

- Wide selection of IF and video filter bandwidths
- Switchable video filters
- Switchable IF filters
- Half/full transponder operation
- Gated/averaging AFC for NTSC, PAL/SECAM and B-MAC/D2-MAC video formats
- ED synchronization for encrypted video format
- External subcarrier port
- ATIS (Automatic Transmitter Identification System)

IF OUTPUT

Center frequency	70 MHz
Peak deviation by video	5 to 18 MHz, adjustable
Impedance	75 ohms
Level	-25 to +2 dBm adjustable (higher output levels optional)
Linearity	< ±1.5%, ±18 MHz, (< ±1% optional)
Group delay (±18 MHz)	
Linear	0.05 ns/MHz maximum
Parabolic	0.0025 ns/MHz^2 maximum

AMPLITUDE/GROUP DELAY

Group delay adjustment range	70 ±18 MHz
Linear	0 to ±1.5 ns/MHz/section
Parabolic	0.04 to 0.15 ns/MHz^2/section
Amplitude slope adjustment range	±3 dB

AFC SYNTHESIZED REFERENCE SOURCE (APPLIES TO GATED AFC OPTION)

Frequency range	55 to 85 MHz
Step size	10 kHz

VIDEO INPUT

Level	1 V p-p
Impedance	75 ohms
Return loss	30 dB minimum

VIDEO CHARACTERISTICS (BACK-TO-BACK WITH WIDEBAND REFERENCE DEMODULATOR, HIGH C/N)

Frequency response	10 Hz to 6 MHz, ±0.3 dB maximum, 10 Hz to 10 MHz, ±0.35 dB maximum (video filter out)
Short-time distortion	< ±1%
Chrominance/luminance gain error	< ±1.5 IRE
Chrominance/luminance delay error	< ±4.5 ns nominal without video filter, < ±20 ns with optional video filter
Differential gain	< ±1%
Differential phase	< ±0.5°
S/N luminance (weighted)	70 dB minimum (half transponder)

ENERGY DISPERSAL WAVEFORM

Frequency	25/30 Hz, phase locked to video frame rate
Stability	±1 Hz
Deviation (factory preset)	1 MHz p-p with video, 2 MHz p-p without video (can be set for other customer satellite requirements)
Variable mode	Adjustable from 1 to 8 MHz p-p minimum (the deviation is halved automatically with presence of video)

AUDIO

Input level	+18 dBm maximum
Input impedance	600 ohms balanced (others available)
Frequency response	100 Hz to 12 kHz, 0.6 dB p-p, 40 Hz to 15 kHz, < 1 dB p-p
Harmonic distortion	< 0.5%, 150 kHz p-p deviation, < 1%, 840 kHz p-p deviation
Pre-emphasis	50/75 µs and J17 response, switchable
Signal/noise	> 62 dB, 300 kHz p-p deviation

SUBCARRIER MODULATOR

Subcarrier deviation	Adjustable 25 to 420 kHz peak
70 MHz IF carrier deviation by subcarrier	Adjustable from 5% to 20% of deviation by video
Subcarrier IF frequency	Adjustable from 5 to 8.2 MHz in 10 kHz step size

ELECTRICAL SPECIFICATIONS (CONT.)

PRIMARY POWER REQUIREMENTS

Voltage ..... 100/120/220/240 VAC, ±10%, rear panel selectable
Frequency ..... 47 to 63 Hz
Power consumption ..... 80 W typical, can vary with number of subcarriers and options

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 19" x 22" x 3.5"
Weight ..... 27 pounds

CONNECTORS

Video input ..... BNC female
Audio input ..... Three-terminal block
B-MAC sync input ..... BNC female (optional)
ED sync input ..... BNC female (optional)
External subcarrier input ..... BNC female (optional)
Contact closure output ..... 25-pin male, D type
Chassis ground ..... 10-32 stud

OPTIONS

M1 525 NTSC video filter (4.2 MHz flat, 4.5 MHz -3 dB) (included in NTSC systems).
M2* 625 B-PAL video filter (5.1 MHz flat, 5.5 MHz -40 dB).
M3* 625 D-PAL video filter (6 MHz flat, 6.5 MHz -40 dB).
M4* 625 I-PAL or wideband B-PAL video filter (5.5 MHz flat, 6 MHz -40 dB).
M5 Video filter switching between any two combinations of Options M1, M2, M3 or M4.
M6 Additional switchable IF filter.
M6A2 Automatic selection of up to four preset deviation settings for two IF filters for half/full transponder operations for NTSC and PAL/SECAM video formats.
M8 Switchable gated/averaging AFC with front panel LED indicator of the synthesizer lock status of the IF spectrum shift.
M9 Switchable gated, either B-MAC or D2-MAC and averaging AFC.
A. External AFC synchronization for B-MAC.
B. External AFC synchronization for D2-MAC.
M10 Automatic external ED synchronization for:
A. Encrypted PAL/SECAM, NTSC video formats (rear panel composite video sync or normal video input).
B. IRDETO video format (rear panel composite video sync input only).
C. M10A and M10B combined (rear panel composite video sync input only).
M12 SIS (Sound in Sync) operation.
M13 ATIS (Automatic Transmitter Identification System).
M14 External wideband subcarrier input (rear panel BNC).
M15 Baseband mute.
M16 70 MHz auxillary output (rear panel BNC).
M18 IF loop interface.
M19 Video polarity select.
M21 High level IF output power (+10 dBm).

* Either M2, M3 or M4 included in PAL/SECAM systems.

HIGH-PERFORMANCE VIDEO/AUDIO DEMODULATORS

70 AND 140 MHz

MODELS VDMD-2000 AND VDMD-2140

- Up to three programmable audio subcarrier demodulators expandable to five with ASDM-100 audio subcarrier demodulator expansion system
- Up to two switchable video filters
- Up to two switchable IF filters

MODEL VDMD-2004

- Up to four programmable audio subcarrier demodulators expandable to six with ASDM-100 audio subcarrier demodulator expansion system
- Up to four switchable IF filters
- Built-in switching of four IF filters
- Half/full transponder operation

MODEL VDMD-2000ADEQ

- Up to two programmable audio subcarrier demodulators
- Up to two switchable IF filters
- Four stages of linear/parabolic group delay equalization
- IF amplitude slope equalization
- Up to two video filters

These demodulators are designed for applications that require high signal-to-noise ratios and minimum distortion of the transmitted information, for both video and audio signals. The applications include half/full transponder multiloop terrestrial and satellite links where cumulative distortions render conventional demodulator performance unacceptable. These demodulators are designed to meet or exceed RS-250C short-haul and IESS-306 standards, and are compatible with NTSC, PAL/SECAM, B-MAC, D2-MAC, SIS, IRDETO and encrypted PAL/SECAM and NTSC video formats, with selection of appropriate options.

FEATURES

- Adaptable to a wide variety of video formats
- Satellite and system amplitude/group delay equalization (VDMD-2000ADEQ only)
- IF amplitude slope equalization (VDMD-2000AEDQ only)
- High-performance video clamp
- Synthesized front panel, thumbwheel programmable audio subcarrier demodulators
- Multiple de-emphasis selection for video and audio
- Switchable audio subcarrier receiver bandwidths
- Front panel IF spectrum monitor
- Video present status indicator
- Contact closure and summary alarm
- Auto/manual AGC mode
- One IF filter and one video filter of customer's choice.

ELECTRICAL SPECIFICATIONS

IF INPUT

Center frequency	70 MHz
Peak deviation	18 MHz
Level	-40 to 0 dBm
Linearity	< ±1.5%, ±18 MHz, < ±0.75%, ±18 MHz (optional)

VIDEO OUTPUT

Level	1 V p-p, ±3 dB continuous adjust
Impedance	75 ohms

CLAMP

Dispersal clamping	40 dB nominal

VIDEO AND AUDIO CHARACTERISTICS (BACK-TO-BACK REFERENCE MODULATOR, HIGH C/N)

VIDEO

Frequency response	10 Hz to 6 MHz ±0.3 dB maximum, 10 Hz to 10 MHz < ±0.35 dB
Short-time distortion	±1% maximum
Chrominance/luminance delay error	±20 ns maximum (with video filter)
Differential gain	±1% maximum
Differential phase	±0.8° maximum
S/N luminance (weighted)	68 dB minimum (half transponder)

AUDIO

Output level	+8 dBm maximum
Frequency response	100 Hz to 12 kHz, ±0.3 dB
Amplitude response	40 Hz to 15 kHz, < ±1 dB
Harmonic distortion	< 0.5%, 150 kHz p-p deviation, < 1%, 450 kHz p-p deviation
Signal/noise (weighted)	> 62 dB, 300 kHz p-p deviation

SUBCARRIER DEMODULATOR

Subcarrier IF level	Front panel programmable 5 to 8.2 MHz in 10 kHz step size

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, ±10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	80 W typcial, can vary with number of subcarriers and options

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions

VDMD-2000	19" x 20" x 3.5"
VDMD-2004	19" x 20" x 5.25"
VDMD-2000ADEQ	19" x 22" x 3.5"
VDMD-2140	19" x 22" x 3.5"

Weight

VDMD-2000	27 pounds
VDMD-2004	31 pounds
VDMD-2000ADEQ	27 pounds
VDMD-2140	27 pounds

MECHANICAL SPECIFICATIONS (CONT.)

CONNECTORS (FOR ALL VIDEO DEMODULATOR MODELS)

IF input..... BNC female
Video output..... BNC female
Composite output..... BNC female
Audio outupt..... Three-terminal block
Contact closure..... 25-pin male, D type
Remote interface ..... (Not available with VDMD-2000ADEQ)
  RS232 ..... 25-pin male, D type (optional)
  RS422/485 ..... 9-pin male, D type (optional)
Chassis ground..... 10-32 stud

OPTIONS

D1 525 NTSC video filter (4.2 MHz flat, f_3 dB 4.5 MHz) (included in NTSC systems).
D2* 625 B-PAL video filter (5.1 MHz flat, f_{40} dB 5.5 MHz).
D3* 625 D-PAL video filter (6 MHz flat, f_{40} dB 6.5 MHz).
D4* 625 I-PAL video filter (5.5 MHz flat, f_{40} dB 6 MHz).
D5 Video filter switching of any two options of D1, D2, D3 or D4.
D6 Additional switchable IF filter.
D6A2 Automatic selection of four preset deviation settings for two IF filters for half/full transponder operation for up to two video formats.
D7 Additional equalized IF filter (VDMD-2004 series).
D7A Automatic selection of eight preset deviation settings for up to four IF filters for half/full transponder operation for up to two video formats (VDMD-2004 series).
D8 SIS (Sound in Sync) operation.
D9 Video polarity selection.
D10 IF loop interface.
D11 De-emphasized gain equalized composite output.
D12 Programming interface for audio expansion subsystem.
D13 Linearity ≤ ±0.75%, ±18 MHz.

REMOTE OPTION PACKAGES (EXCLUDING VDMD-2000ADEQ SERIES)
(Option R11 must be ordered for this package)

DPR3 Includes R1, R2A3, R4, R5.
DPR4 Includes R1, R3, R4, R5 (VDMD-2004 only).
ADRP Subcarrier demodulator, Options R6, R7, R9.

REMOTE OPTION EXPLANATIONS

R1 NTSC/PAL/SECAM de-emphasis or flat response select.
R2A3 Full/half transponder operation for up to two video formats and two IF filters.
R3 Full/half transponder operation for up to two video formats and four IF filters.
R4 Video filter switching of any two combinations of Options D1, D2, D3 or D4.
R5 Video clamp in/out.
R6 Audio 50/75 µs, J17 de-emphasis response select.
R7 Programming of any subcarrier frequencies from 5 to 8.2 MHz in 10 kHz steps.
R8 Video polarity select.
R9 Subcarrier IF bandwidth select.
R11 Remote interface bus programming through RS232, RS485 or RS422. Customer must specify bus operation on order).

* Either D2, D3 or D4 included in PAL/SECAM systems.

AUDIO SUBCARRIER DEMODULATOR EXPANSION SYSTEM

MODEL ASDM-100

The ASDM-100 expansion system is a one-rack unit capable of supporting up to two local or remote programmable audio subcarrier demodulators. This extends the total number of subcarriers supported by the VDMD-2004 video demodulator system to six. Local operation of the expansion subcarrier demodulator is at the front panel of the system. Remote programming of the subcarrier demodulators is accomplished via the VDMD-2004 remote port. A special remote port is provided on both the VDMD-2004 and the subcarrier demodulator expansion system for intra-system local communication.

SPECIFICATIONS

Number of subcarrier channels/systems ..... Up to two

PROGRAMMABLE SUBCARRIER DEMODULATOR

Subcarrier ..... Synthesized from 5 to 8.5 MHz, IF frequency in 10 kHz step size

AUDIO

Output level ..... -35 to +10 dBm
Output impedance ..... 600 ohms balanced (others available)
Return loss ..... 30 dB minimum
Switchable audio subcarrier receiver bandwidths ..... 180/280/600 kHz switchable
Frequency response ..... 100 Hz to 12 kHz, 0.6 dB p-p, 40 Hz to 15 kHz, < 1 dB p-p
Harmonic distortion ..... < 0.5%, 150 kHz p-p deviation, < 1%, 450 kHz p-p deviation
De-emphasis ..... 50/75 µs, J17 switchable
Signal/noise (weighted) ..... > 62 dB, 300 kHz p-p deviation

PRIMARY POWER REQUIREMENTS

Voltage ..... 100/120/220/240 VAC, +10%, rear panel selectable
Frequency ..... 47 to 63 Hz
Power consumption ..... 20 W typical

PHYSICAL

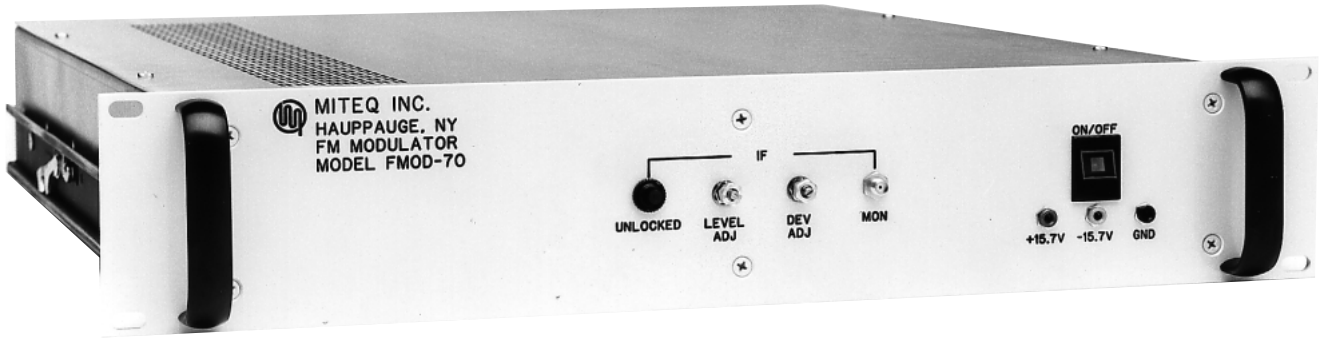
Dimensions ..... 19” x 24” x 1.75”
Weight ..... 14 pounds

CONNECTORS

Subcarrier IF input ..... BNC
Audio output ..... Three-terminal block
Remote programming ..... 9-pin male, D type (to VMDM-2004 video demodulator)
Contact closure ..... 9-pin male, D type
Ground ..... 10-32 stud

FM / PM MODULATORS / DEMODULATORS

MODELS FMOD-70, PMOD-70, FDMOD-70 AND PDMOD-70



These high-quality narrow-band modulators and demodulators are designed to generate a highly stable low-phase noise 70 MHz carrier, phase locked to an internal reference crystal oscillator. The main carrier deviation accuracy is less than 0.45 dB p-p while maintaining excellent linearity across the entire baseband frequency range. Applications include telemetry systems and ranging equipment.

FEATURES

- 5 to 30 kHz baseband information bandwidth
- Excellent baseband frequency response
- Ultra low phase noise

MODULATORS		DEMODULATORS	
FMOD-70	70 MHz IF, FM modulator	FDMOD-70	70 MHz IF, FM demodulator
PMOD-70	70 MHz IF, PM modulator	PDMOD-70	70 MHz IF, PM demodulator

ELECTRICAL SPECIFICATIONS

IF OUTPUT

Center frequency	70 MHz
Stability	±2 kHz
Level	0 dBm nominal
Linearity	±1% ±400 kHz for FM modulator, ±1° for PM modulator

FM CHARACTERISTICS

Peak-to-peak frequency deviation	±400 kHz (see Options)
Frequency response	5 to 30 kHz, ±0.3 dB (wider frequency response available)
Input level	2.8 V p-p with ±3 dB continuous adjust

PM CHARACTERISTICS

Phase deviation	±1 radian (wider available)
Frequency response	5 to 30 kHz, ±0.3 dB
Input level	2.8 V p-p with ±3 dB continuous adjust

TYPICAL PHASE NOISE

Offset from carrier

100 Hz	68 dBc/Hz
1 kHz	67 dBc/Hz
10 kHz	78 dBc/Hz
100 kHz	129 dBc/Hz
1 MHz	133 dBc/Hz
10 MHz	140 dBc/Hz

ELECTRICAL SPECIFICATIONS (CONT.)

PRIMARY POWER REQUIREMENTS

Voltage ..... 100/120/220/240 VAC, ±10%, rear panel selectable
Frequency ..... 47 to 63 Hz
Power consumption ..... 20 W typical, can vary with options

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 19" x 20" x 3.5"
Weight ..... 16 pounds

CONNECTORS

FMOD-70 AND PMOD-70

IF output ..... BNC female
Baseband input ..... BNC female
Contact closure output ..... 9-pin male, D type
Chassis ground ..... 10-32 stud

PDMOD-70 AND PDMOD-70

IF input ..... BNC female
Baseband output ..... BNC female
Contact closure output ..... 9-pin male, D type
Chassis ground ..... 10-32 stud

OPTIONS

FMOD-70 AND PMOD-70

PF1 < ±500 Hz carrier stability.
PF2 -10 to +10 dBm continious IF level adjust.
PF3 -20 to 0 dBm continious IF level adjust.
PF4 Fixed +10 dBm IF output.
PF5 Customer-defined baseband frequency response.
PF6 Complete redundant system in the same chassis.
PF7 55 to 85 MHz in 100 kHz step front panel programmable IF frequency (wide IF bandwidth).
PF8 Customer-defined phase deviation.
PF9 Customer-defined FM deviation.

FDMOD-70 AND PDMOD-70

PFD1 -60 to 0 dBm IF level input range.
PFD2 Customized receive IF bandwidth.
PFD3 Customer-defined baseband frequency response.
PFD4 Complete redundant receive chain in the same chassis.
PFD5 55 to 85 MHz in 100 kHz step front panel programmable receive chain (wide IF bandwidth).

MULTIFRAME UPLINK MODULATOR

MODEL MFUM-70

The MFUM-70 is a high-quality front panel and remote programmable multiframe uplink modulator with external and internal frequency pulse modulation. Features include framing pulse fall/rise time programmability, internal pulse width and PRF programmability, agile IF frequency and signal detection/alarm status. The MFUM-70 is used in a TDMA system by converting the referenced traffic multiframe pulse from a network synchronization system to a modulated IF carrier which is subsequently transmitted to the satellite. The satellite TDMA processor processes this signal to maintain synchronization with the communication's network timing and manage mobile-to-mobile cellular call traffic through the satellite.

FEATURES

- Programmable IF frequency from 50 to 90 MHz in 100 kHz step
- External/internal modulation select
- Framing pulse/rise time programmability
- Internal pulse width/PRF programmability

ELECTRICAL SPECIFICATIONS

IF OUTPUT

Frequency range	50 to 90 MHz (100 kHz programming resolution)
IF output level	-30 to -10 dBm (0.5 dB programming resolution)
Inband gain flatness	< ±0.4 dB
Input/output impedance	75 ohms
IF isolation	> 60 dB
Harmonics	50 dBc minimum
Phase noise	
Offset from carrier	
100 Hz	-60 dBc/Hz
1 kHz	-75 dBc/Hz
10 kHz	-100 dBc/Hz
100 kHz	-110 dBc/Hz
1 MHz	-125 dBc/Hz

IF MODULATION INPUT

External gate input	Differential of single-ended TTL
Input rise/fall time	< 5 µs
Input pulse width	> Programmed (rise time + fall time) x 0.625
Output rise/fall time	Programmable, 5 to 50 µs (0.1 µs programming resolution)

INTERNAL MODULATOR GATE

PRF	2 Hz to 20 Hz (0.0001 Hz frequency resolution)
Pulse width	20 to 400 µs (0.1 µs programming resolution)
Rise-time programming	5 to 50 µs (0.1 µs programming resolution)
Fall-time programming	5 to 50 µs (0.1 µs programming resolution)

ELECTRICAL SPECIFICATIONS (CONT.)

MODES OF OPERATION
External modulation gate, sync and trigger
Internal modulation gate
Continuous IF output, no modulation
IF mute

ALARM OUTPUTS
Gate input detect
Pulsed IF output detect
Power supply failure detect

REMOTE PROGRAMMING
Remote interface bus programming through RS422/485 or RS232

PRIMARY POWER REQUIREMENTS
Voltage ..... 100/120/220/240 VAC, ±10%, rear panel selectable
Frequency ..... 47 to 63 Hz
Power consumption ..... 25 W typical

MECHANICAL SPECIFICATIONS

PHYSICAL
Dimensions ..... 19" x 22" x 1.75"
Weight ..... 14 pounds

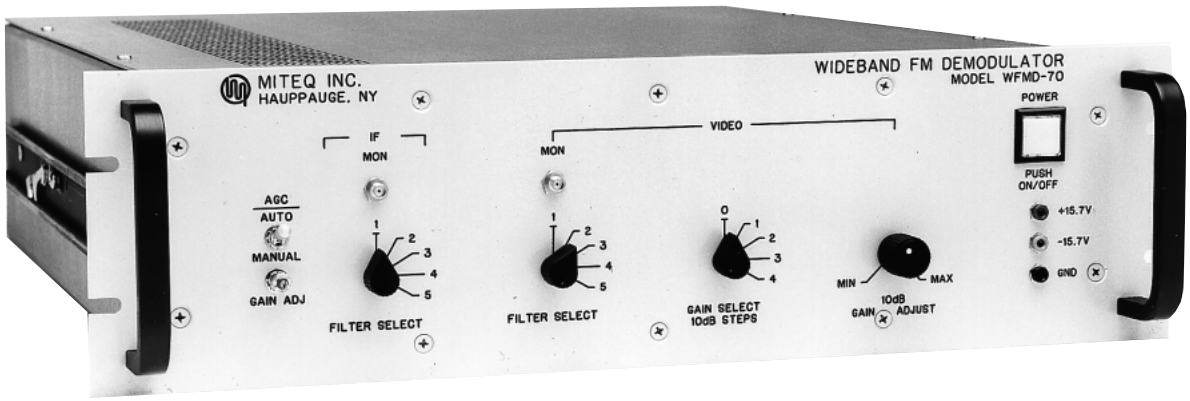
CONNECTORS
IF output ..... BNC female
IF monitor ..... BNC female
Gate sync input ..... 9-pin male, D type
Gate sync monitor ..... BNC female
Contact closure output ..... 9-pin male, D type
Remote interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type
Chassis ground ..... 10-32 stud

OPTIONS

MU1 IF output level programming (customer to specify the range).
MU2 Selection of equalized IF filters from 17.5, 18, 20, 22, 24, 25, 26, 27, 30, 33, 36 and 40 MHz.

MULTIBAND COMMUNICATION 70 MHz FM DEMODULATOR

MODEL WFMD-70



MITEQ's WFMD-70 demodulator is designed to receive a 70 MHz FM modulated carrier in the range of -60 to 0 dBm and recover the baseband signal with high fidelity. These demodulators are equipped with five front panel selectable baseband filters and equalized IF filters, optionally expandable to seven. The system is provided with a very high-performance wideband video amplifier, with adjustable gain up to 50 dB (40 dB in 10 dB steps and 10 dB continuous adjust).

FEATURES

- Selectable baseband and equalized IF filters
- ±1% demodulator linearity
- Baseband amplitude ripple of ±0.25 dB
- -60 to 0 dBm IF input range

ELECTRICAL SPECIFICATIONS

IF INPUT

Center frequency ..... 70 MHz
Noise figure..... 20 dB maximum
Input level range ..... -60 to 0 dBm
IF gain control..... 60 dB AGC and MGC
Input impedance ..... 75 ohms
Input return loss..... 18 dB minimum
Number of IF filters..... 5 bands with the following specifications (see Options)

IF FILTER BANDWIDTH	GROUP DELAY (G/3 BAND)	AMPLITUDE RIPPLE (A BAND)
30 MHz	3 ns maximum	±0.30 dB
24 MHz	4 ns maximum	±0.25 dB
16 MHz	6 ns maximum	±0.20 dB
12 MHz	8 ns maximum	±0.25 dB
8 MHz	12 ns maximum	±0.35 dB

Note: For group delay and amplitude ripple characteristics of the table above, refer to FEQ-70-xx series, group delay equalized IF filters. (See catalog C-33, page 24).

IF filter shape factor (3/60 dB)..... 3:1
Number of video filters..... 5 bands
Video bandwidth ..... 4, 6, 8, 12 and 15 MHz
Video filter characteristics..... 5-pole Bessel ±0.25 dB (see Options)

ELECTRICAL SPECIFICATIONS (CONT.)

OUTPUT

Level	2 volts p-p into 75 ohms
Impedance	75 ohms
Amplitude ripple	±0.25 dB
Video response (1 dB)	20 Hz to selected video bandwidth
Gain control range	0 to 50 dB minimum, 40 dB in 10 dB steps and 10 dB continuous adjust

TRANSFER CHARACTERISTICS

Receiver FM linearity	±1% maximum

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, ±10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	75 W typical

MECHANCAL SPECIFICATIONS

PHYSICAL

Dimensions	19" x 20" x 5.25"
Weight	26 pounds

CONNECTORS

IF input	BNC female
Baseband output	BNC female
IF monitor	SMA female
Contact closure output	9-pin male, D type
Chassis ground	10-32 stud

OPTIONS

MBD-1xx	Additional equalized IF filter bandwidths from 1.25, 2.5, 5, 7.5, 8, 10, 12, 15, 17.5, 18, 20, 22, 24, 25, 26, 27, 33, 34, 36 and 40 MHz.
MBD-2	Chebychev characteristic baseband filters (customer to specify).
MBD-3	Butterworth characteristic baseband filters (customer to specify).
MBD-4	7 dB IF chain noise figure.

VIDEO, AUDIO, IF, EXTERNAL SUBCARRIER AND SYNC 1:1 REDUNDANT SWITCHOVER SYSTEM

MODEL MRSS-70VAESI

The MRSS-70VAESI Video, Audio, IF, External Subcarrier and Sync 1:1 Redundant Switchover System is used with one online video modulator and one standby modulator. It automatically switches over to the standby video modulator when a fault is detected within the online system. Switching may also be controlled manually, either through the front panel keypad or via remote command. The standby modulator can carry traffic while there is no fault with the online modulator.

FEATURES

- All switching is provided via latching type relays
- Shield planes for IF, video, external subcarrier and sync are fully independent and isolated from system chassis
- Extremely low-noise operation and high performance
- Completely floating audio inputs and outputs
- Fully automatic or manual control
- Programmable fault masks permit fault alarms to be individually enabled or disabled
- Automatically programs the standby modulator to match the operating parameters of the modulator that has been taken offline (when used with MITEQ modulators)
- Remote/local control permits control of the switchover system over a remote interface bus (RS485, RS422, RS232) or via a front panel keypad and LCD display
- Both modulators can be programmed from the front panel of the switchover system, or through the remote interface bus (when used with MITEQ modulators)
- Provides fault status of the modulators and switchover system and online/offline/not-connected status for each modulator
- Redundant power supply

ELECTRICAL SPECIFICATIONS

VIDEO SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 80 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (in to redundant out)	< 0.1 dB
Number of baseband inputs	2
Number of baseband outputs	2

AUDIO SWITCHING

Frequency	DC to 50 kHz
Amplitude flatness	< 0.1 dB p-p
Impedance	600 ohms balanced
Return loss	> 30 dB
Channel-to-channel isolation	> 80 dB
System-to-system isolation	> 85 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (in to redundant out)	< 0.05 dB
Number of audio inputs	2 ports with 4 channels per port
Number of audio outputs	2 ports with 4 channels per port

IF SWITCHING

Frequency	50 to 90 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
Isolation	> 80 dB
Number of IF inputs	2
Number of IF outputs	2 (1 system output and 1 monitor port)

EXTERNAL SYNC SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 20 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (in to redundant out)	< 0.2 dB
Number of sync inputs	2
Number of sync outputs	2

EXTERNAL SUBCARRIER SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (in to redundant out)	< 0.2 dB
Number of subcarrier inputs	2
Number of subcarrier outputs	2

SWITCH TIMING

Switching speed	< 100 ms from fault detection to switchover

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, +10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	20 W steady state, 35 W during switchover

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 19" x 22" x 1.75"
Weight ..... 18 pounds

CONNECTORS

Online System

Audio input/output ..... 8-pin DIN
Video input/output ..... BNC female
External subcarrier input/output ..... BNC female
IF input/output ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface RS422/485 ..... 9-pin male, D type

Redundant System

Audio output ..... 8-pin DIN
Video output ..... BNC female
External subcarrier output ..... BNC female
External sync output ..... BNC female
IF input ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface RS422/485 ..... 9-pin male, D type

Switchover System

Host interface RS422/485 ..... 9-pin male, D type
Contact closure output ..... 25-pin male, D type
Chassis ground ..... 10-32 stud

CONFIGURATIONS

IFI-1 IF switching.
VAI1-1 Video, audio and IF switching.
VA1-1 Video and audio switching.

OPTIONS

ESC1 External subcarrier.
ESYC1 External synchronization.

VIDEO, AUDIO, IF, EXTERNAL SUBCARRIER AND SYNC 1:4 REDUNDANT SWITCHOVER SYSTEM

MODEL MRSS-704VAESI

The MRSS-704VAESI Video, Audio, IF, External Subcarrier and Sync 1:4 Redundant Switchover System is used with up to four online video modulators and one standby modulator. It automatically switches over to the standby video modulator when a fault is detected within the online systems. Switching may also be controlled manually, either through the front panel keypad or via remote command.

FEATURES

- All switching is provided via latching type relays
- Shield planes for IF, video, external subcarrier and sync are fully independent and isolated from system chassis
- Extremely low-noise operation and high performance
- Completely floating audio inputs and outputs
- Fully automatic or manual control can be individually selected for each modulator
- Programmable fault masks permit fault alarms to be individually enabled or disabled
- Automatically programs the standby modulator to match the operating parameters of the modulator that has been taken offline (when used with MITEQ modulators)
- Remote/local control permits control of the switchover system over a remote interface bus (RS485, RS422, RS232) or via a front panel keypad and LCD display
- All connected modulators can be programmed from the front panel of the switchover system, or through the remote interface bus (when used with MITEQ modulators)
- Provides status indicators for:
  - Fault status of the modulators and switchover system
  - Online/offline/not connected status for each modulator
  - Auto/manual mode indication for each online modulator
- Redundant power supply

ELECTRICAL SPECIFICATIONS

VIDEO SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 80 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (in to redundant out)	< 0.1 dB
Number of baseband inputs	4
Number of baseband outputs	5

AUDIO SWITCHING

Frequency	DC to 50 kHz
Amplitude flatness	< 0.1 dB p-p
Impedance	600 ohms balanced
Return loss	> 30 dB
Channel-to-channel isolation	> 80 dB
System-to-system isolation	> 85 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (in to redundant out)	< 0.1 dB
Number of audio inputs	4 ports with 4 channels per port
Number of audio outputs	5 ports with 4 channels per port

IF SWITCHING

Frequency	50 to 90 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 20 dB
System-to-system isolation	> 65 dB
Redundant-to-system isolation	> 63 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (redundant in to out)	< 0.25 dB
Insertion loss (in to monitor out)	< 0.25 dB
Number of IF inputs	5
Number of IF outputs	5 (4 system outputs and 1 monitor port)

EXTERNAL SYNC SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (in to redundant out)	< 0.2 dB
Insertion loss (in to monitor out)	< 0.25 dB
Number of sync inputs	4
Number of sync outputs	5

EXTERNAL SUBCARRIER SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (in to redundant out)	< 0.2 dB
Number of subcarrier inputs	4
Number of subcarrier outputs	5

SWITCH TIMING

Switching speed	< 100 ms from fault detection to switchover

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, +10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	25 W steady state, 40 W during switchover

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 19" x 22" x 5.25"
Weight ..... 22 pounds

CONNECTORS

Online Systems

Audio input/output ..... 8-pin DIN
Video input/output ..... BNC female
External subcarrier input/output ..... BNC female
External sync input/output ..... BNC female
IF input/output ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type

Redundant System

Audio output ..... 8-pin DIN
Video output ..... BNC female
External subcarrier output ..... BNC female
External sync output ..... BNC female
IF input ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type

Switchover System

Host interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type
Contact closure output ..... 25-pin male, D type
Discrete input ..... 25-pin male, D type
Discrete output ..... 25-pin male, D type
Chassis ground ..... 10-32 stud

CONFIGURATIONS

1:2

IF4-2	IF switching.
VAI4-2	Video, audio and IF switching.
VA4-2	Video and audio switching.

1:4

IF4-4	IF switching.
VAI4-4	Video, audio and IF switching.
VA4-4	Video and audio switching.

OPTIONS

ESC4-2 or 4	External subcarrier.
ESYC4-2 or 4	External synchronization.
DSCO	Discrete TTL-level outputs for controlling additional switching equipment.
UALM	Discrete inputs for user-defined fault alarms.

VIDEO, AUDIO, IF, EXTERNAL SUBCARRIER AND SYNC 1:N REDUNDANT SWITCHOVER SYSTEM

MODEL MRSS-708VAESI

The MRSS-708VAESI Video, Audio, IF, External Subcarrier and Sync 1:N Redundant Switchover System is used with up to eight online video modulators and one standby modulator. It automatically switches over to the standby video modulator when a fault is detected within the online systems. Switching may also be controlled manually, either through the front panel keypad or via remote command. The standby modulator can carry traffic while there is no fault with the online modulators.

FEATURES

- All switching is provided via latching type relays
- Shield planes for IF, video, external subcarrier and sync are fully independent and isolated from system chassis
- Extremely low-noise operation and high performance
- Completely floating audio inputs and outputs
- Fully automatic or manual control can be individually selected for each modulator
- Programmable fault masks permit fault alarms to be individually enabled or disabled
- Automatically programs the standby modulator to match the operating parameters of the modulator that has been taken offline (when used with MITEQ modulators)
- Remote/local control permits control of the switchover system over a remote interface bus (RS485, RS422, RS232) or via a front panel keypad and LCD display
- All connected modulators can be programmed from the front panel of the switchover system, or through the remote interface bus (when used with MITEQ modulators)
- Provides status indicators for:
  - Fault status of the modulators and switchover system
  - Online/offline/not connected status for each modulator
  - Auto/manual mode indication for each online modulator
- Redundant power supply

ELECTRICAL SPECIFICATIONS

VIDEO SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 80 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (redundant in to out)	< 0.1 dB
Insertion loss (in to switched out)	< 0.1 dB
Number of baseband inputs	9
Number of baseband outputs	9

AUDIO SWITCHING

Frequency	DC to 50 kHz
Amplitude flatness	< 0.1 dB p-p
Impedance	600 ohms balanced
Return loss	> 30 dB
Channel-to-channel isolation	> 80 dB
System-to-system isolation	> 80 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (redundant in to out)	< 0.1 dB
Insertion loss (in to switched out)	< 0.1 dB
Number of audio inputs	9 ports with 4 channels per port
Number of audio outputs	9 ports with 4 channels per port

IF SWITCHING

Frequency	50 to 90 MHz
Amplitude flatness	< 0.15 dB p-p
Impedance	75 ohms
Return loss	> 20 dB
System-to-system isolation	> 60 dB
Redundant-to-system isolation	> 55 dB
Insertion loss (in to out)	< 0.15 dB
Insertion loss (redundant in to out)	< 0.3 dB
Insertion loss (online in to offline out)	< 0.3 dB
Number of IF inputs	9
Number of IF outputs	9 (8 system outputs and 1 monitor port)

EXTERNAL SYNC SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (in to redundant out)	< 0.1 dB
Insertion loss (in to switched out)	< 0.1 dB
Number of sync inputs	9
Number of sync outputs	9

EXTERNAL SUBCARRIER SWITCHING

Frequency	DC to 10 MHz
Amplitude flatness	< 0.1 dB p-p
Impedance	75 ohms
Return loss	> 26 dB
System-to-system isolation	> 75 dB
Insertion loss (in to out)	< 0.05 dB
Insertion loss (redundant in to out)	< 0.1 dB
Insertion loss (in to switched out)	< 0.1 dB
Number of subcarrier inputs	9
Number of subcarrier outputs	9

SWITCH TIMING

Switching speed	< 150 ms from fault detection to switchover

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, +10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	30 W steady state, 60 W during switchover

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 9" x 22" x 8.75"
Weight ..... 28 pounds

CONNECTORS

Online Systems

Audio input/output ..... 8-pin DIN
Video input/output ..... BNC female
External subcarrier input/output ..... BNC female
External sync input/output ..... BNC female
IF input/output ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type

Redundant System

Audio output ..... 8-pin DIN
Video output ..... BNC female
External subcarrier output ..... BNC female
External sync output ..... BNC female
IF input ..... BNC female
Contact closure input ..... 25-pin male, D type
Remote interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type

Switchover System

Host interface
  RS232 ..... 25-pin male, D type
  RS422/485 ..... 9-pin male, D type
Contact closure output ..... 25-pin male, D type
Discrete input ..... 25-pin male, D type
Discrete output ..... 25-pin male, D type
Chassis ground ..... 10-32 stud

CONFIGURATIONS

1:6

IF8-6	IF switching.
VAI-6	Video, audio and IF switching.
VA8-6	Video and audio switching.

1:8

IF8-8	IF switching.
VAI8-8	Video, audio and IF switching.
VA8-8	Video and audio switching.

OPTIONS

ESC8-6 or 8	External subcarrier.
ESYC8-6 or 8	External synchronization.
DSCO	Discrete TTL-level outputs for controlling additional switching equipment.
UALM	Discrete inputs for user-defined fault alarms.

PULSED RADAR TRACKING RECEIVER

MODEL PRTR-44

The pulsed radar tracking receiver consists of an RF front end and a tracking LO subsystem. The inputs to the system are coupled signals from the transmitter (Magnetron) and the received RF signal return from the target. The RF transmitter signal can be any frequency between 2.8 to 3.2 GHz. The coupled signal from the transmitter is detected and fed to an AFC processor. The AFC processor sweeps a local oscillator, mixes the output with the coupled RF signal and disables the sweep when the local LO subsystem is approximately 35 MHz above the RF signal. After the initial lock is obtained, a digital AFC tracking system is activated which fine tunes the local oscillator to precisely 35 MHz above the coupled RF signal. The digital AFC then continuously tracks the RF coupled signal. The digital AFC processor keeps the system in-lock even in the absence of a large number of RF pulses (AFC dead-time ride through). The LO output signal is mixed in the RF front-end mixer to generate a system IF output at 35 MHz. The doppler shift is detected as an offset from the 35 MHz IF output. These pulsed radar tracking receivers are primarily used in moving target indicator (MTI) systems.

FEATURES

- Real-time software and hardware, digital AFC processing
- Programmable frequency accuracy control and update rate optimization
- Accurate frequency control in the absence of RF pulses (dead time)
- Interface and control flexibility

PRTR-44 ADVANTAGES COMPARED TO EXISTING SYSTEMS

- Digital tracking eliminates the instabilities present in conventional AFC processors (temperature variation, offsets, etc.)
- Digital processing algorithms are used to achieve a more accurate lock than conventional AFC processors
- Digital processing enables better control and provides more flexibility

ELECTRICAL SPECIFICATIONS

RF Input frequency	3 GHz ±200 MHz (see Options). Available frequency bands from 1 to 35 GHz
Input bandpass filter	40 MHz bandwidth. Tunable from 2.8 to 3.2 GHz. Other bandwidths available across the input frequency band
Tracking range	±200 MHz, wider bands available
Pulse width	0.4 µs @ 2500 PRF, 0.8 µs @ 1250 PRF. Other pulse widths and PRFs available
Dynamic range	80 dB
RF-to-IF gain	75 dB
IF center frequency	See options
IF gain adjust	45 dB, wider gain adjust range available
IF bandwidth	6 MHz (see Options)
AFC tracking accuracy	±0.1 MHz
AFC dead-time ride through	30 ms (see Options)
IF output power	+12 dBm minimum
Noise figure	< 5 dB includes loss from input bandpass filter

PRIMARY POWER REQUIREMENTS

Voltage	100/120/220/240 VAC, ±10%, rear panel selectable
Frequency	47 to 63 Hz
Power consumption	85 W typical

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions	21" x 9.75" x 6"
Weight	27 pounds

CONNECTORS

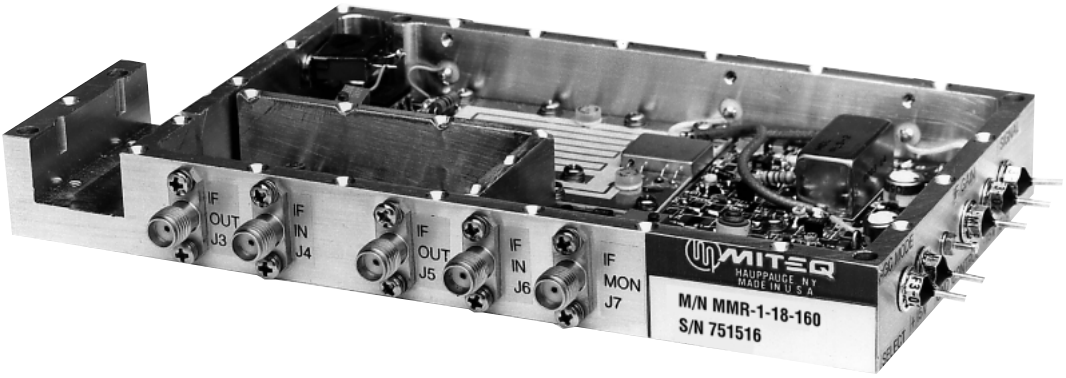
RF input/output	SMA female
IF output	SMA female
IF monitor	SMA female
AC power	MS3102A18-22P
Remote/control/status	MS3102A22-27P
DC power monitor	Test point jack

OPTIONS

P1 RF input frequency range (customer to specify).
P2 RF input bandpass filter (customer to specify).
P3 Auto sweep bandwidth at RF, available bandwidths are ±200, ±400 and ±800 MHz.
P4 IF center frequency selection, 21.4, 30, 35, 60 and 160 MHz (customer to specify).
P5 IF bandwidth (customer to specify).
P6 PRF range (customer to specify).
P7 Pulse width range (customer to specify).

MINIATURE MICROWAVE FM RECEIVER

MODEL MMR-1-18-160



The MMR-1-18-160 series microwave receiver inputs an FM modulated signal in the frequency range of 1 to 18 GHz and a local oscillator in the range of 1 to 18 GHz, producing a high-performance demodulated wideband baseband signal. The receiver is integrated with additional features to provide flexible configurations via U-links. An IF loop is provided for IF signal test and integration of an external group-delay equalized IF filter, if required.

FEATURES

- Low-noise front end
- IF filter
- Remote/local and automatic/manual IF gain control
- IF signal monitoring
- Limiter/discriminator
- Baseband variable gain amplifier
- Input signal status monitor

ELECTRICAL SPECIFICATIONS

Center frequency	1 to 18 GHz (see Options)
Input signal	-70 to -30 dBm (see Options)
Input impedance	50 ohms
Input VSWR	3.5:1 at band edges, 2.5:1 over most of the band
Input IP3	-5 dBm
Input IP2	0 dBm
LO-to-RF isolation	12 dB minimum
LO power	+7 to +10 dBm
Noise figure	12 dB maximum
IF frequency	160 MHz (see Options)
IF rejection	20 dB minimum
IF gain control AGC or MGC at input	40 dB, from -70 to -30 dBm (see Options)
AGC/MGC selection method	TTL logic
IF bandwidth	10 MHz (see Options)
Filter bandwidth shape factor (3/45 dB)	< 5:1
Bandwidth ripple	±0.5 dB maximum
Group delay variation for 10 MHz IF bandpass filter	
±3 MHz	22 ns
±3.5 MHz	44 ns
±4 MHz	66 ns
Demodulation sensitivity	0.05 to 1 V/MHz
Video bandwidth	DC to 15 MHz (see Options)
Video gain control	Manual

ELECTRICAL SPECIFICATIONS (CONT.)

Discriminator linearity
- IF ±10 MHz..... < ±1% for a 70 MHz IF
- IF ±35 MHz ..... < ±3% for a 160 MHz IF

Output impedance ..... 75 ohms (50 ohms available)
Gain control voltage vs. gain ..... 0 volts maximum gain, -5 volts minimum gain
Input signal status monitor..... 0 volts no signal, -2 volts -30 dBm

PRIMARY POWER REQUIREMENTS

Current/voltage ..... 280 mA @ +15 volts
30 mA @ -15 volts

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 6" x 7" x 3"

CONNECTORS

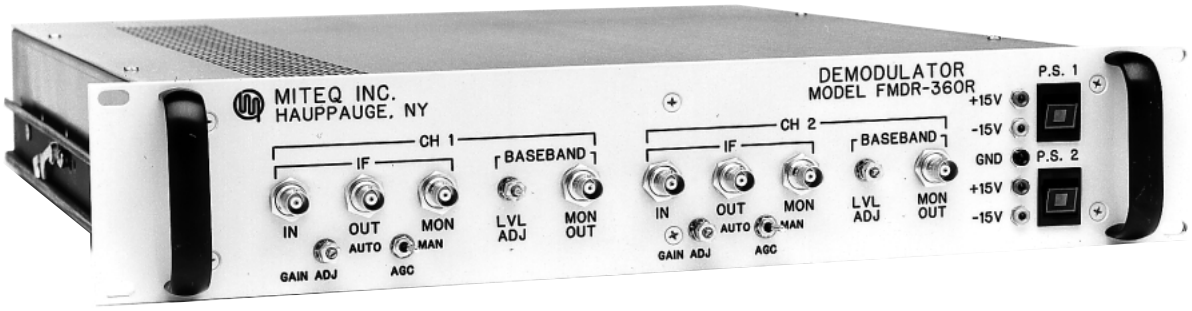
RF input ..... SMA female
LO input ..... SMA female
IF loop output..... SMA female
IF loop input..... SMA female
IF monitor output ..... SMA female
Baseband output..... SMA female
AGC mode select control..... Feedthru terminal
DC power..... Feedthru terminal
Housing ground ..... 2-56 terminal

OPTIONS

MR1 Input frequency (customer to specify).
MR2 Higher input level up to 0 dBm.
MR3 Lower noise figure (customer to specify).
MR4 60 dB range IF gain.
MR5 IF frequency selection: 21.4, 30, 35, 60 and 160 MHz.
MR6 IF filter selection (customer to specify).
MR7 I/Q processing, bandwidth DC to 30 MHz.
MR8 Linearity < ±2%, ±35 MHz for 160 MHz IF.

DUAL-CHANNEL SINGLE-CONVERSION FM RECEIVER SYSTEMS

MODEL FMDR-360
360 MHz TO 18 GHz



These receivers have been designed to accept FM modulated carriers centered from 360 MHz to 18 GHz (see Options) in the range of -70 to -35 dBm and recover the baseband with a high signal-to-noise ratio at low C/N. Each receiver channel is equipped with its own independent power supply. Applications include voice communications (50 Hz to 15 kHz), telemetry systems and ranging equipment.

FEATURES

- Excellent IF-to-baseband characteristics
- Customer-defined IF pre-detection bandwidth and modulation frequency
- Customer-defined input IF frequency
- Redundant system

ELECTRICAL SPECIFICATIONS	FMDR-360	FMDR-360R
Center frequency	360 MHz (see Options)	360 MHz (see Options)
Level	-70 to -35 dBm (see Options)	-70 to -35 dBm (see Options)
Automatic gain control (AGC)	> 40 dB	> 40 dB
Manual gain control (MGC)	> 40 dB	> 40 dB
Impedance	50/75 ohms available	50/75 ohms available
Input VSWR	1.25:1	1.25:1
IF pre-detection bandwidth	±300 kHz	±500 kHz (see Options)
Gain flatness	±0.5 dB over ±100 kHz -3 dB @ ±300 kHz	±0.5 dB over ±400 kHz -3 dB @ ±1 MHz
Out-of-band rejection	-15 dB @ ±600 kHz	-20 dB @ ±2 MHz
Group delay over IF frequency response	< 25 ns over the central ±100 kHz bandwidth	< 15 ns over the central ±400 kHz bandwidth
Group-delay ripple response	< ±5 ns over the central ±100 kHz bandwidth	< ±3 ns over the central ±350 kHz bandwidth
Modulation frequency	100 to 150 kHz (see Options)	300 to 350 kHz (see Options)
Modulation index	0.7 to 2	0.7 to 2
Demodulator threshold (C/N)	9 dB maximum	9 dB maximum
Demodulator linearity	4% over ±125 kHz (see Options)	5% over ±350 kHz (see Options)
Output level	-10 dBm ±5 dB with deviation of 125 kHz peak (front panel pot adjust)	-10 dBm ±5 dB with deviation of 350 kHz peak (front panel pot adjust)
Output impedance	50/75 ohms available	50/75 ohms available
Voltage	100/120/220/240 VAC, ±10%	100/120/220/240 VAC, ±10%
Frequency	47 to 63 Hz	47 to 63 Hz
Power consumption	55 W	55 W

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions ..... 19” x 22” x 3.5”
Weight ..... 28 pounds

CONNECTORS

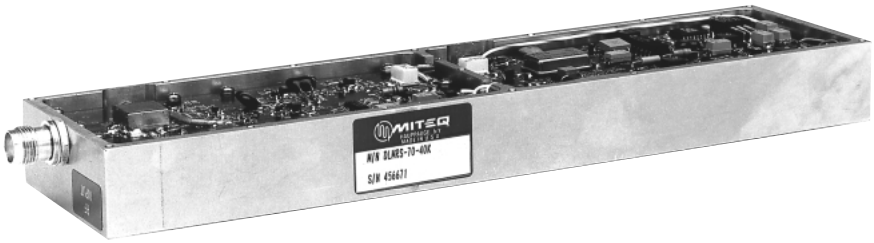
IF input ..... BNC female
IF loop ..... BNC female
Baseband output ..... BNC female
Monitor output ..... BNC female
Contact closure output ..... CH1/CH2 9-pin male, D type
Chassis ground ..... 10-32 stud

OPTIONS

DR1 Input frequency select 360 MHz to 18 GHz (customer to specify).
DR2 -70 to -10 dBm input range.
DR3 IF pre-detection bandwidth (customer to specify).
DR4 Modulation frequency range (customer to specify).
DR5 Improved linearity (customer to specify).
DR6 C/N < 9 dB.
DR7 C/N < 5 dB.

MINIATURE FSK RECEIVER

MODEL DLMRS-70-40K
300 MHz TO 1.2 GHz



The DLMRS-70-40K FSK synthesized receiver is designed to receive custom-defined IF carriers in the band 300 MHz to 1.2 GHz and recover the baseband information with high fidelity. The receiver is a dual-conversion type and contains the following features:

- RF preselector filter and RF front end
- Wide dynamic range AGC
- Wide dynamic range limiter
- Intermediate crystal and ceramic filtering
- Fast-programmable synthesizer in 100 kHz steps
- Demodulation and output level signal conditioning

The DLMRS-70-40K synthesized receiver is used in voice communications and telemtry applications.

FEATURES
- Wide dynamic range (110 dB)
- Dual-conversion IF processing
- Fast programmable synthesizer (< 1 ms lock time)
- Built-in test
- Compact size 1.1” x 2.7” x 10”

ELECTRICAL SPECIFICATIONS

Input frequency	300 to 324.9 MHz (see Options)
Preselect input filter bandwidth	3 dB, ±12.5 MHz, 60 dB, ±87.5 MHz
Channel programming	100 kHz steps
Channel selection time	< 2 ms
Receiver frequency stability	±1 kHz
Input dynamic range	-100 to +10 dBm minimum
Input impedance	50 ohms
Return loss	15 dB
Channel rejection	> 50 dB
FSK data rate	30 Hz to 10 kHz (see Options)
Deviation	±20 kHz, +20 kHz for logic "1", -20 kHz for logic "0"
IF filter bandwidth	3 dB, ±35 kHz, 60 dB, ±70 kHz
Image rejection	> 50 dB
Automatic gain control	55 dB
Limiting range	55 dB (see Options)
Data bandwidth	30 Hz to 10 kHz (see Options)
IF bandwidth	> 20 kHz
Video output level	
Logic "1"	250 mV, ±50 mV, others available (see Options)
Logic "0"	-250 mV, ±50 mV, others available (see Options)
Output impedance	1000 ohms, others available (see Options)
Power supply rejection ratio	> 40 dB
Operating temperature	-62 to +70˚C

PRIMARY POWER REQUIREMENTS

Current/voltage	500 mA @ +15 volts 50 mA @ -15 volts

MECHANICAL SPECIFICATIONS

PHYSICAL

Dimensions	2.65" x 10" x 1.1

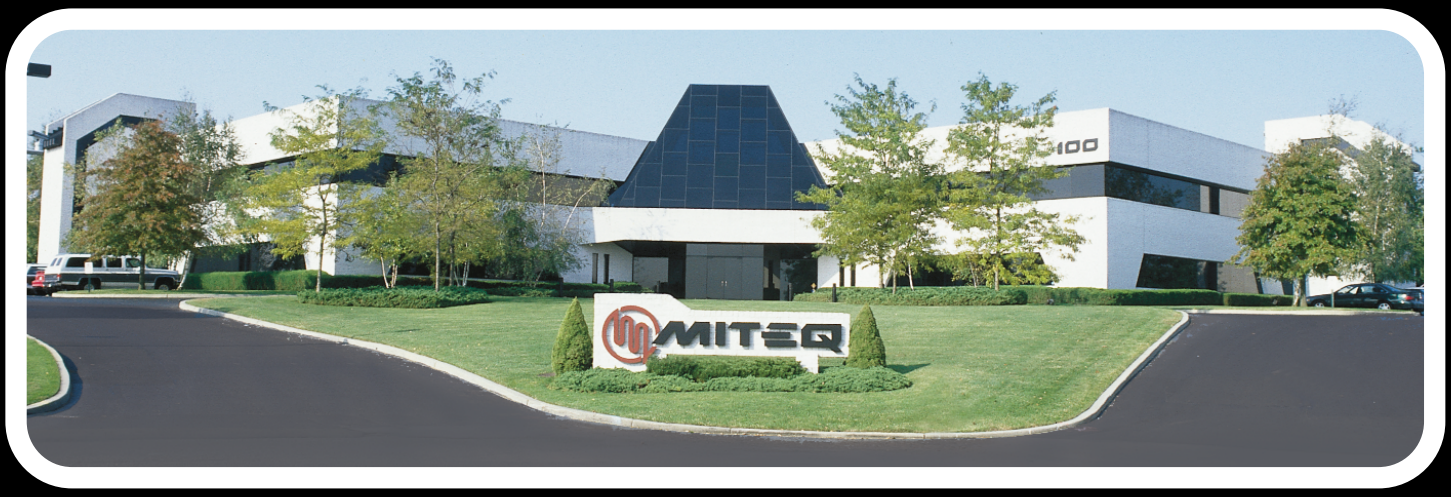
CONNECTORS

Baseband output/control DC power input/ground	25-pin male, D type
IF input	F type (others available)

OPTIONS

K1 Input frequency select 300 MHz to 1.2 GHz (customer to specify).
K2 Video output level (customer to specify).
K3 Output impedance (customer to specify).
K4 Higher FSK data rate (customer to specify).
K5 110 dB limiting range only (no AGC).

PRODUCT INDEX



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