



FM Multiplex Monitor

TYPE BW-73

CATALOG

B.6308



FEATURES

- Provides accurate check on FM multiplex transmission
- High quality selective filter-type circuits
- Ultra-linear counter detector
- Indicates total modulation on chassis
- Broadband I.F. and discriminator circuits
- Complete accessibility for servicing
- Provision for remote monitoring of all metered functions
- Stereo output provided

DESCRIPTION

The Type BW-73 FM Multiplex Monitor is essentially a sub-carrier monitor for use at all FM broadcast stations specializing in Multiplex transmission. In particular, a station may now easily monitor subcarrier injection and subcarrier deviation; measurements which heretofore have been difficult without complex instrumentation.

Specifically, the BW-73 will perform the following functions: indicate total modulation on the main carrier, the subcarrier(s) modulation of the main carrier, per cent program modulation on each subcarrier, beep tone modulation of main carrier, the swing on any external subcarrier, and will measure the RF input level to assure proper operating conditions in the monitor. A front panel flasher lamp with adjustable threshold will indicate modulation peaks in any of the above services. In addition, outputs are available for aural monitoring of the above through phones or station lines. The Monitor will give continuous

indication directly in per cent of main carrier deviation by the subcarrier.

Terminals are provided for the connection of external meters for remote monitoring of all metered functions. A separate output is provided for interconnection of the station's distortion and noise meter. With this set-up, accurate measurements may quickly be made of signal-to-noise, distortion and frequency response. Similarly, the BW-73 will measure main-to-subcarrier as well as subcarrier-to-subcarrier crosstalk.

The Type BW-73 FM Multiplex Monitor is designed to mount in a standard relay rack. The equipment is a self-contained unit mounted on a vertical chassis. All circuits are mounted on the chassis behind a hinged front panel which greatly facilitates maintenance and servicing. Tubes are accessible from the rear. The two meters (modulation and deviation), peak indicator lamp and operating con-

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trols are located on the front panel for ease of operation and monitoring.

The RF input signal is injected on a 50 ohm line and the level adjusted according to meter indication. The input level chosen was such that the monitor would be capable of making overall transmitter measurements and yet be relatively insensitive to spurious or unwanted signals. The oscillator is crystal controlled and operates at 10.7 mc above the station channel. The mixer stage is followed by broadband I.F. and discriminator circuitry. The succeeding amplifier output is switch selected for choice of monitoring mode. The subcarrier filters are plug-in units allowing fast convenient changes or additions of subcarriers should the need arise.

The subcarrier chain employs two double anode zener diodes in cascade guaranteeing the stability of the limiting level. At this point, the FM wave is applied to the pulse-counter detector where it is demodulated. Residual subcarrier is removed in the low pass filter and the remaining audio signal drives two separate stages. The first of these de-emphasizes the modulation, and it is this output which may be used for aural monitoring and distortion measurements in conjunction with an auxiliary distortion and noise meter. The second stage is an amplifier for driving the peak modulation indicator stage and the vacuum tube

voltmeter-type modulation meter. The VTVM stage is compensated against zero drift. The ballistics characteristics of the meter meet the requirements of the FCC. The electronically regulated power supply is self-contained.

SPECIFICATIONS

Electrical

RF Input:	
Frequency Range.....	88-108 mc
Impedance.....	50 ohms unbalanced
Sensitivity.....	2 to 14 volts
Main Carrier:	
Frequency Response (30-15,000 cps).....	±0.5 db max. ¹
Harmonic Distortion (30-15,000 cps).....	0.5% max.
Noise Level.....	-65 db max. ²
Frequency Deviation for 100% Mod.....	±75 kc
Subcarrier: ³	
Frequency Response (30-6,000 cps).....	±0.5 db max. ¹
Harmonic Distortion.....	1% max.
Noise Level.....	-65 db max. ⁴
Center Frequency Range.....	30 to 67 kc
Frequency Deviation for 100% Mod.....	±7.5 kc
Outputs:	
Audio Monitoring Circuit:	
Source Impedance.....	150 ohms balanced/600 ohms balanced
Level.....	Adjustable/1 volt
Audio Distortion Meter Circuit:	
Source Impedance.....	20,000 ohms
Level (at 100% Mod.).....	4 volts
Subcarrier Source Impedance.....	680 ohms
Subcarrier Level.....	0.2 volt ⁵
Stereo Source Impedance.....	600 ohms
Power—DC.....	250 volts regulated, 75 ma
Power—AC.....	6.3 volts, 3 amps

Modulation Indication:	
Accuracy.....	5%
Frequency Response (30 cps to 65 kc).....	±1.0 db
Range.....	0 to 133%; -10 to +2 db (0 db equal to 100%)
Deviation Indication:	
Accuracy.....	2%
Range.....	0 to 30%
Power Requirements.....	105-125 volts ac, 50/60 cps single phase, 140 watts
Fuse.....	3 amps, 3AG

Tube Complement:
1—6AS6, 5—6AU6A, 1—6C4, 3—12AT7, 1—OB2, 2—12AU7A,
2—12AX7A, 1—5814A, 1—5R4GY, 1—6AS7G

Mechanical Specifications

Mounting.....	Standard 19" rack
Dimensions.....	19" wide, 14" high, 10" deep
Weight.....	45 lbs.
Finish.....	Light Umber Gray

Equipment Supplied

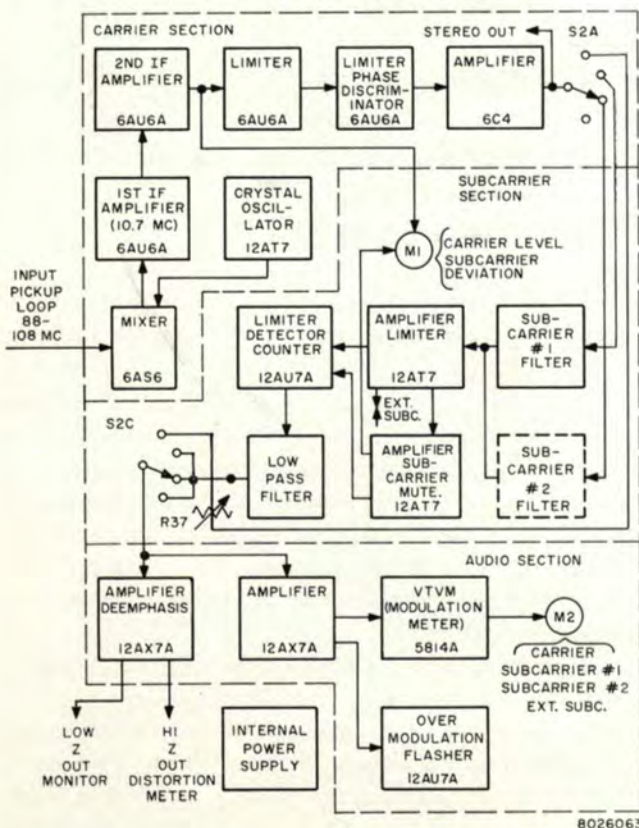
Type BW-73 FM Multiplex Monitor Complete.....	ES-560200
Including the following:	
FM Multiplex Monitor.....	MI-560310
Crystal Unit.....	MI-560311*
Subcarrier Filter.....	MI-560312*
(*Sales order to specify customer's frequency)	

Optional Auxiliary Items

Remote Deviation Meter.....	MI-560313
Remote Modulation Meter.....	MI-560314
Stereo Adapter.....	MI-560317
Type WM-71A—Distortion and Noise Meter.....	MI-30071-A
Type WA-28A—Push Button Low Distortion Oscillator.....	MI-30028-A

¹ Audio Frequency response referred to 75 microsecond de-emphasis curve.
² Referred to ±75 kc deviation, 100% modulation, at 400 cps.
³ For precise measurement of frequency response and distortion above 400 cps, the shorting plug should be in the socket (XZ1 or XZ2) corresponding to the subcarrier under measurement.
⁴ Referred to ±7.5 kc deviation, 100% modulation, at 400 cps.
⁵ Subcarrier modulated 15% on main carrier.

Functional diagram of BW-73 Monitor.



RADIO CORPORATION OF AMERICA
Broadcast & Television Equipment
Camden, N. J.