



Broadcast Equipment

Type BW-51
AM Modulation Monitor

MI-561042

WARRANTY ITEMS

Particular parts and/or equipment covered by warranty are specifically stated as such in the warranty or contract given to the customer at the time of sale. The warranty or contract also stipulates the conditions under which the warranty may be exercised.

To obtain a new replacement for such warranty items, contact your local RCA sales office and please supply Product Identification (including the Original Invoice Number, MI Number, Type Number, Model Number, and Serial Number) and Replacement Part Identification (including Stock Number and Description). Requests for warranty replacements may be unduly delayed if all this information is not supplied.

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage **WITHIN 15 DAYS** after receipt. Report all shortages and damages to RCA, Communication Systems Division — Camden, New Jersey 08102.

RCA will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

FIELD ENGINEERING SERVICE

RCA Field Engineering Service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Incorporated — Broadcast Service Division — Camden, New Jersey 08102. Telephone 609-963-8000.

TECH ALERT

Emergency 24 hour telephone consultation service for technical problems is available. Call **TECH ALERT** at 609-963-8000 extension PC3434. Telex messages will be forwarded to the addressee upon receipt. Western Union telex number is 83-4450.

SAFETY PRECAUTIONS

This equipment is designed to fully safeguard all personnel from operating hazards. Labels on the equipment and caution notices in the instruction book clearly point out these potential hazards.

Any module or Printed Wiring Board may have hazardous voltages exposed, so caution must be exercised.

Follow the recommended procedures provided in the Instruction Book for care and maintenance of the equipment.

Always replace the protective covers after servicing the equipment.

PARTS ORDERING INFORMATION

REPLACEMENT PARTS

When ordering replacement parts, please give Stock or Master Item (MI) Number, Description, and Symbol of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or

electrical characteristics. Such differences will in no way impair the operation of the equipment.

EMERGENCY SERVICE

For emergency service after working hours, contact RCA Distributor and Special Products Division, Telephone 609-963-8000 or 609-848-5900.

LOCATION	ORDERING INSTRUCTIONS
Continental United States, including Alaska and Hawaii	<p>Replacement Parts bearing a STOCK NUMBER should be ordered from RCA Distributor and Special Products Division — 2000 Clements Bridge Road — Deptford, New Jersey 08096.</p> <p>Replacement Parts bearing a MASTER ITEM (MI) NUMBER should be ordered from RCA, Commercial Electronics Systems Division — Attention Commercial Service — Camden, New Jersey 08102 or your nearest RCA Regional Office.</p> <p>Replacement Parts with NO STOCK or MASTER ITEM (MI) NUMBER are standard components. They are not stocked by RCA and should be obtained from your local electronics distributor.</p>
Dominion of Canada	Order from your local RCA Sales Representative or his office or from: RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, Hawaii, and the Dominion of Canada	<p>Order from your local RCA Sales Representative or from: RCA International Division, Clark, New Jersey — U.S.A. — Wire: RADIOINTER</p> <p>Emergency: Cable RADIOPARTS, DEPTFORD, N.J.</p>

TECHNICAL SUMMARY

RF Frequency Range

200 kHz to 160 MHz

RF Sensitivity

5 to 10 volts RMS

RF Input Impedance

1000 ohms (50 ohms optional)

Modulation Meter Range (switchable to either positive or negative peaks)

0 to 133%

Carrier Level Meter Range

±30%

Modulation Meter Accuracy

2% at 100% modulation

Peak Modulation Indicator* (switchable to either positive or negative peaks)

40 to 130% in less than 1% increments

Peak Modulation Indicator Accuracy

2%

100% Negative Indicator*

adjustable 85 to 100%

125% Positive Indicator*

adjustable 100 to 130%

Carrier Off Alarm

fixed to alarm with a 30% drop in carrier level

Frequency Response

0.5 dB from 20-25,000 Hz

Pulse Response

overshoot less than 1%

Distortion

0.25% max. at 99% modulation

Signal to Noise Ratio

75dB

Remote Metering

meters may be remotely metered — 5000 ohms external loop resistance

Aural Monitoring Output

+10 dBm, 600 ohms

Aural Proof of Performance Output

5 volts RMS

Power Requirements

115/230 V, 50 to 400 Hz, at 8 Watts

Operating Temperature Range

0° C to +50° C

Dimensions

5 1/4" x 19" x 6" (133 x 483 x 152 mm)

Net Weight

8 lbs (3.6 kg)

Shipping Weight

12 lbs (5.4 kg)

*Peak modulation, 100% negative and 125% positive indicators are true ratio types and will hold their accuracies over a ±30% input carrier level change.

EQUIPMENT SUPPLIED

BW-51 AM Modulation Monitor

For 117V/234V (switchable), 50/60 Hz MI-561042

FCC Type Approval No. 3-230

ACCESSORIES

Remote Meter and Flasher Panel MI-561047

BW-60 Monitor RF Amplifier MI-560762

Shielded Loop Antenna for BW-60 MI-561325

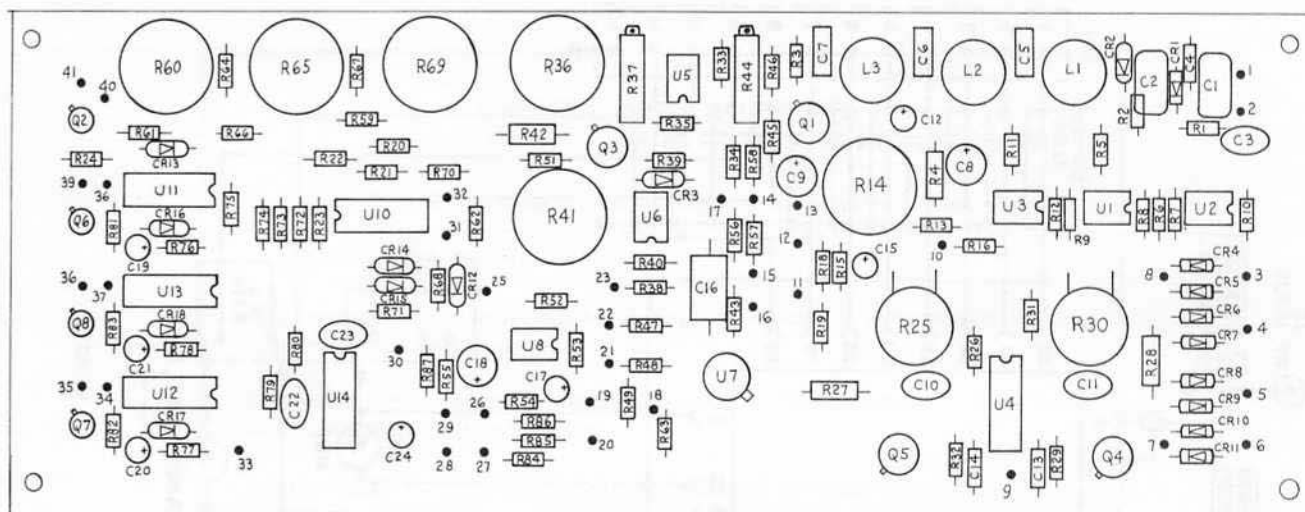


Figure 1. Components, BW-51 circuit card

DESCRIPTION

The RCA BW-51 AM Modulation Monitor is an all solid state, precision AM demodulator designed to meet FCC requirements (Type Approval No. 3-230) for measuring the total modulation characteristics of AM broadcast transmitters. Since the input circuitry is non-frequency discriminating, the BW-51 is also suitable for use with HF and VHF transmitters. A switch is provided to measure either positive or negative polarities on the modulation meter and normal peak indicator. Separate peak indicators indicate negative peaks in excess of 99% and positive peaks in excess of 125%. The monitor incorporates a carrier-off alarm and a modulation calibrator to ensure the accuracy of the readings at any time.

The BW-51 is constructed on a standard EIA 5¼ x 19-inch rack mount. Calibration adjustments are located within the unit and are accessible through the back cover. The AC power input, RF input, and monitor outputs are located at the rear of the chassis on individual connectors and rear terminal block. The BW-51 is completely solid state, utilizing all silicon transistors and integrated circuits for long, trouble-free life. Light-emitting diodes are used for the indicators to eliminate lamp burn-out. The individual circuits are constructed on a military-grade, glass-epoxy, plated, printed circuit board. High-reliability military and industrial grade components are used throughout.

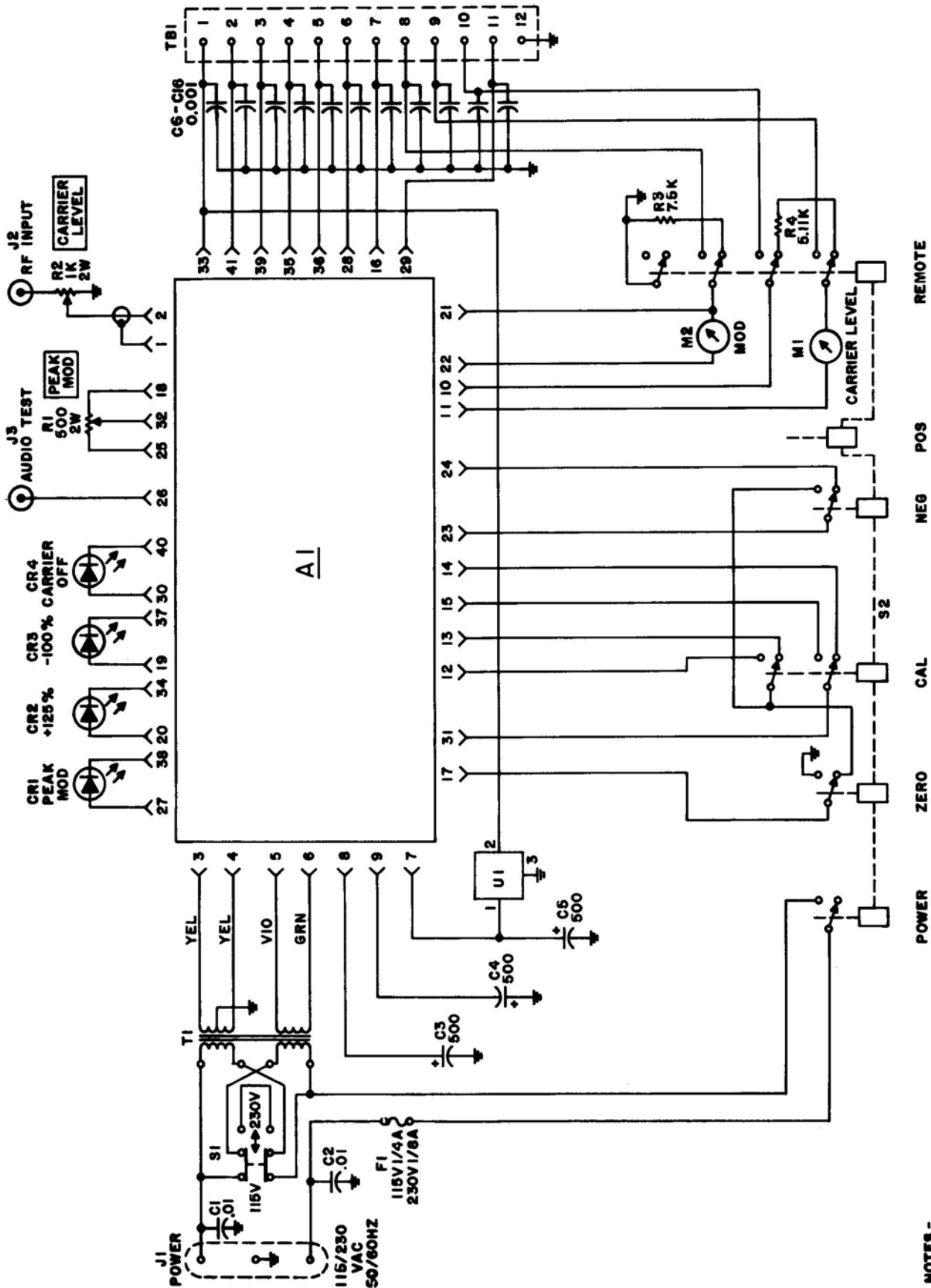
ACCESSORIES

The BW-51 Modulation Monitor may be used for remote monitoring of an AM transmitter with either the RCA Remote

Meter and Flasher Panel (MI-561047) or the RCA BW-60 RF Amplifier (MI-560762). The Remote Meter and Flasher Panel contains a carrier level deviation meter, modulation meter, 3 peak lights, and carrier-off light. The RF amplifier provides preamplification and selectivity to permit direct off-air monitoring with the BW-51.

CIRCUITS

The BW-51 is a low-sensitivity, precision AM demodulator incorporating a highly linear, biased diode detector. The detector circuit will accurately demodulate AM envelopes of carriers from 200 kHz to 160 MHz. Various metering and testing provisions are contained within the monitor to measure transmitter output characteristics. These provisions include a zero center carrier level deviation meter; a peak-reading modulation meter, switchable to either positive or negative modulation polarity; a peak modulation light, adjustable from 40 to 130% peak modulation and switched with the modulation meter to either positive or negative modulation polarity; a peak modulation light that responds when the negative modulation exceeds 99%; a peak modulation light that responds when the positive modulation exceeds 125%; a DC-type modulation calibrator to check the ratio between the carrier level and peak modulation reading; a carrier-off light that responds when the carrier is less than 70% of nominal value (this may be set to other values by the change of a resistor value). Monitor outputs include an output for aural monitoring, a distortion meter test output, a transistor driver for carrier-off alarm, and a transistor driver for remoting each of the three peak lights.



NOTES -
ALL RESISTOR VALUES ARE IN OHMS.
ALL CAPACITOR VALUES ARE IN MICROFARADS.

Figure 2. Interconnections, BW-51 components

INSTALLATION

The BW-51 is designed to be mounted in a standard 19-inch rack mount using four No. 10 screws and washers. A slight air space should be provided above and below the unit for ventilation. When the monitor is mounted above vacuum tube power supplies or other high-heat generating equipment, provisions should be made for free movement of cooler air around the unit. Do not allow ambient chassis temperature to rise above 50°C (122°F).

CONNECTIONS

The BW-51 requires a 115/230 VAC, single-phase, 50-400 Hz power source. The monitor is easily converted from 115 to 230 volt operation by changing the position of the slide switch located on the rear panel so that the designation appearing on the switch matches the nominal voltage of the power source. NOTE: this should be done with the unit disconnected from the power source.

The three-conductor power cable supplied, when plugged into an appropriate 3-contact receptacle, grounds the unit. To preserve the grounding feature when operating the unit from a two-contact outlet, use a grounded three-prong to two-prong adaptor.

CAUTION: Before applying any RF input, turn carrier level control fully counterclockwise.

Connect a coaxial cable between the monitoring probe on the transmitter (or RF Amplifier) and the RF INPUT connector J2, at the rear of the main chassis.

CAUTION: Do not apply more than 15 volts RF to the monitor or the RF input circuit may be damaged.

If desired, connect the external aural monitoring amplifier to terminals 11 and 12 on TB1. Note that this is an unbalanced 600 ohm output with terminal 12 grounded. A remote carrier level deviation meter may be connected to terminals 9 and 10. A remote modulation meter may be connected to terminals 8 and 12. Observe the proper polarities (terminals 8 and 9 are positive), and note that the external loop resistance requirement must be met. If only one remote meter is used, the other metering circuit must be terminated on TB1 in order for the internal meters to read correctly when the remote meter switch is depressed. For example, if only a remote modulation meter is used and the remote meter switch is depressed, the modulation meter will read correctly but the carrier level meter will not read unless a 5.1 K resistor is placed between terminals 8 and 9 on TB1. Remote modulation meters should

be obtained from RCA in order to conform with the correct ballistic requirements. A remote peak modulation light may be connected to terminals 1 and 3 on TB1. Remote 100% negative, 125% positive, and carrier-off lights may be connected to the appropriate terminals on TB1. Note that terminal 1 is a 5-volt DC source, and if LED's are used for the lights, series resistors must be used to limit the current to safe values for the LED's used. The remote meters and lights are contained in the RCA Remote Meter and Flasher Panel.

PRELIMINARY ADJUSTMENTS

The following procedure should be used to place the unit into initial operation.

1. Before turning the unit on, be sure the position of the 115-230 VAC switch on back apron coincides with the voltage source used.
2. Depress the ZERO switch and release the REMOTE switch. Turn CARRIER SET control maximum counterclockwise.
3. Depress POWER switch. Note that the % CARRIER LEVEL DEVIATION meter is pegged to the left, the CARRIER OFF alarm light is on, and the MODULATION meter is approximately zero. Allow a few minutes' warm-up.
4. After warm-up, the MODULATION meter should read zero. If it does not read zero but is only off a few percentage points, it may be set to read zero with the mechanical zero control on the meter. If the zero is off more than a few percentage points, the zero should be set as described on Page 9. The electrical zero is stabilized by a feed-back operational amplifier and normally does not need readjustments.
5. Rotate the CARRIER SET control clockwise. The CARRIER OFF light will go out at approximately minus 30% carrier level deviation. Continue to rotate the control so that the CARRIER LEVEL DEVIATION meter reads zero. Note that this is the carrier level SET point.
6. Depress the CAL switch. The MODULATION meter will read 100% to verify the accuracy of the calibration. The +125% light will be on.
7. Adjust the PEAK MOD potentiometer to the point where the PEAK MOD light just turns on. This setting will be 100%.
8. Depress the POS or NEG switch for positive or negative modulation reading on the MODULATION meter and PEAK MOD light, and the monitor is ready for operation.

REPLACEMENT PARTS

Symbol	Stock No.	Description
		M1-561042 8W-51 AM MODULATION MONITOR
		CHASSIS
C1	426837	CAPACITOR, FXD CER 0.01UF 1KV
C2	426837	CAPACITOR, FXD CER 0.01UF 1KV
C3 TO		
C5	227721	CAPACITOR, FXD ELECT 500UF 50VDC
C6 TO		
C16	240846	CAPACITOR, FXD CER 0.001UF 1KV
CR1	435569	DIODE - TYPE MV5253
CR2 TO		
CR4	435570	DIODE - TYPE MV5053
M1	435571	METER - % CARRIER LEVEL DEV
M2	248422	METER - % MODULATION 0-133%
R1	248401	RESISTOR, 500 OHMS 2W VARI
R2	435572	RESISTOR, 1K OHM 2W VARI
R3	218700	RESISTOR, 7.5K OHMS 5% 1/4W
R4	236712	RESISTOR, 5.11K OHMS 1% 1/8W
S1	435573	SWITCH - SLIDE
S2	435574	SWITCH - PUSH BUTTON
T1	435575	TRANSFORMER - POWER
U1	436637	I.C. - TYPE MC7805CP
A1		A1 CARD - AM MODULATION MONITOR
C1	428192	CAPACITOR, FXD MICA 1500PF 5% 500V
C2	428192	CAPACITOR, FXD MICA 1500PF 5% 500V
C3	127801	CAPACITOR, FXD CER 0.01UF GMV 100V
C4	239051	CAPACITOR, FXD CER 0.1 UF 20% 50V
C5	922794	CAPACITOR, FXD MICA 270PF 5% 300V
C6	237677	CAPACITOR, FXD MICA 160PF 5% 300V
C7	235435	CAPACITOR, FXD MICA 27PF 5% 300V
C8	435576	CAPACITOR, FXD TANT 47UF 20% 35V
C9	435576	CAPACITOR, FXD TANT 47UF 20% 35V
C10	240846	CAPACITOR, FXD CER 0.001UF GMV 1KV
C11	240846	CAPACITOR, FXD CER 0.001UF GMV 1KV
C12	424892	CAPACITOR, FXD TANT 6.8 UF 20% 25V
C13	239051	CAPACITOR, FXD CER 0.1 UF 20% 50V
C14	239051	CAPACITOR, FXD CER 0.1 UF 20% 50V
C15	424892	CAPACITOR, FXD TANT 6.8 UF 20% 25V
C16	432332	CAPACITOR, FXD FILM 0.22UF 10% 80V
C17	424892	CAPACITOR, FXD TANT 6.8 UF 20% 25V
C18	435576	CAPACITOR, FXD TANT 47UF 20% 35V
C19	135429	CAPACITOR, FXD TANT 15UF 20% 15V
C20	135429	CAPACITOR, FXD TANT 15UF 20% 15V
C21	135429	CAPACITOR, FXD TANT 15UF 20% 15V
C22	127801	CAPACITOR, FXD CER 0.01UF GMV 100V
C23	127801	CAPACITOR, FXD CER 0.01UF GMV 100V
C24	424892	CAPACITOR, FXD TANT 6.8 UF 20% 25V
CR1	244786	DIODE - TYPE 1N4004
CR2	435577	DIODE - TYPE 1N643
CR3	248403	DIODE - TYPE 1N4446
CR4 TO		
CR11	426641	DIODE - TYPE 1N4004
CR12 TO		
CR15	248402	DIODE - TYPE 1N541
CR16	248403	DIODE - TYPE 1N4446
CR17	248403	DIODE - TYPE 1N4446
CR18	248403	DIODE - TYPE 1N4446
L1	435578	INDUCTOR, FXD
L2	435579	INDUCTOR, FXD
L3	435580	INDUCTOR, FXD
Q1	241012	TRANSISTOR - TYPE 2N4037
Q2	248404	TRANSISTOR - TYPE 2N914
Q3	426224	TRANSISTOR - TYPE 2N3053
Q4	426224	TRANSISTOR - TYPE 2N3053
Q5	241012	TRANSISTOR - TYPE 2N4037
Q6	248404	TRANSISTOR - TYPE 2N914
Q7	248404	TRANSISTOR - TYPE 2N914
Q8	248404	TRANSISTOR - TYPE 2N914
		RESISTORS-FIXED COMP., UNLESS NOTED
R1	219466	20K OHMS 5% 1/4W
R2	227465	120K OHMS 5% 1/4W

Symbol	Stock No.	Description
R3	218497	10K OHMS 5% 1/4W
R4	108865	1K OHMS 5% 1/2W
R5	426213	4.7K OHMS 5% 1/4W
R6	427540	10K OHMS 1% 1/8W FILM
R7 TO		
R12	426P35	1K OHMS 1% 1/8W FILM
R13	245260	499 OHMS 1% 1/8W FILM
R14	435581	3K OHMS 2 W WIRE VARI
R15	427540	10K OHMS 1% 1/8W FILM
R16	236712	5.11K OHMS 1% 1/8W FILM
R18	427540	10K OHMS 1% 1/8W FILM
R19	236712	5.11K OHMS 1% 1/8W FILM
R20	218499	10K OHMS 5% 1/4W
R21	108866	2.2K OHMS 5% 1/4W
R22	108865	1K OHMS 5% 1/4W
R23	108869	15K OHMS 5% 1/4W
R24	108866	2.2K OHMS 5% 1/4W
R25	435582	100K OHMS 20% 1/4W VARI
R26	218499	10K OHMS 5% 1/4W
R27	115605	4.7 OHMS 5% 1/2W
R28	115605	4.7 OHMS 5% 1/2W
R29	226972	51 OHMS 5% 1/4W
R30	435582	100K OHMS 20% 1/4W
R31	218499	10K OHMS 5% 1/4W
R32	226972	51 OHMS 5% 1/4W
R33	218499	10K OHMS 5% 1/4W
R34	427540	10K OHMS 1% 1/8W FILM
R35	433173	9.09K OHMS 1% 1/8W FILM
R36	435581	3K OHMS 2 W WIRE VARI
R37	435584	10K OHMS 10% 3/4W FILM VARI
R38	427540	10K OHMS 1% 1/8W FILM
R39	218499	10K OHMS 5% 1/4W
R40	433173	9.09 OHMS 1% 1/8W FILM
R41	435581	3K OHMS 2W WIRE VARI
R42	502215	1.5K OHMS 5% 1/2W
R43	435585	12MEG OHMS 5% 1/8W
R44	435584	10K OHMS 10% 3/4W FILM VARI
R45	108865	1K OHMS 5% 1/4W
R46	108866	2.2K OHMS 5% 1/4W
R47	236181	6.19K OHMS 1% 1/8W FILM
R48	426835	1K OHMS 1% 1/8W FILM
R49	426835	1K OHMS 1% 1/8W FILM
R51	218499	10K OHMS 5% 1/4W
R52	218499	10K OHMS 5% 1/4W
R53	108869	15K OHMS 5% 1/4W
R54	218499	10K OHMS 5% 1/4W
R55	426113	620 OHMS 5% 1/4W
R56	427540	10K OHMS 1% 1/8W FILM
R57	248435	2.49K OHMS 1% 1/8W FILM
R58	427540	10K OHMS 1% 1/8W FILM
R59	427540	10K OHMS 1% 1/8W FILM
R60	435583	1K OHMS 2W WIRE VARI
R61	236712	5.11K OHMS 1% 1/8W FILM
R62	239128	1.1K OHMS 1% 1/8W FILM
R63	239707	221 OHMS 1% 1/8W FILM
R64	236712	5.11K OHMS 1% 1/8W FILM
R65	435581	3K OHMS 2W WIRE VARI
R66	236712	5.11K OHMS 1% 1/8W FILM
R67	236712	5.11K OHMS 1% 1/8W FILM
R68	427540	10K OHMS 1% 1/8W FILM
R69	435581	3K OHMS 2W WIRE VARI
R70	236712	5.11K OHMS 1% 1/8W FILM
R71	427540	10K OHMS 1% 1/8W FILM
R72	108869	15K OHMS 5% 1/4W
R73	108869	15K OHMS 5% 1/4W
R74	108869	15K OHMS 5% 1/4W
R75	108865	1K OHMS 5% 1/4W
R76	426208	30K OHMS 5% 1/4W
R77	426208	30K OHMS 5% 1/4W
R78	426208	30K OHMS 5% 1/4W
R79	113524	2.7K OHMS 5% 1/4W
R80	113524	2.7K OHMS 5% 1/4W
R81	108866	2.2K OHMS 5% 1/4W
R82	108866	2.2K OHMS 5% 1/4W
R83	108866	2.2K OHMS 5% 1/4W
R84 TO		
R87	230616	200 OHMS 5% 1/4W
R88		REPLACEMENT BY MANUFACTURER ONLY
R89		REPLACEMENT BY MANUFACTURER ONLY
U1	432340	I.C. - TYPE MC1741CP1
U2	432340	I.C. - TYPE MC1741CP1
U3	432340	I.C. - TYPE MC1741CP1
U4	435586	I.C. - TYPE MC1468L
U5	432340	I.C. - TYPE MC1741CP1
U6	432340	I.C. - TYPE MC1741CP1
U7	432340	I.C. - TYPE MC5345 CA3140S
U8	432340	I.C. - TYPE MC1741SCP1
U10	435587	I.C. - TYPE MC3302P
U11	432341	I.C. - TYPE N74122A
U12	432341	I.C. - TYPE N74122A
U13	432341	I.C. - TYPE N74122A
U14	425796	I.C. - TYPE MC7404P

RCA Broadcast Equipment

Communications Systems Division/Front and Cooper Streets/Camden, New Jersey, U.S.A., 08102

OPERATION

For normal operation, leave the BW-51 in POS position when broadcasting super-modulation. The MODULATION meter and PEAK MOD light will register the positive peaks. Nominal changes in RF level will not affect the accuracy of the -100%, +125%, or PEAK MOD light.

The PEAK MOD control is usually set to a level slightly lower than +125%, say +120%. Then the modulation may be set for frequent recurrent peaks of +120%, and the separate -100% and +125% lights are used for the limits to insure the maximum level of modulation without exceeding the limits set by the FCC.

Percent carrier shift is read on the % CARRIER LEVEL DEVIATION meter as a change in carrier intensity during

modulation. Note that due to the unique modulation cancellation scheme in the BW-51 to regenerate unmodulated carrier, this change in carrier intensity is independent of modulation symmetry. In this manner, accurate carrier shifts are measured.

TRANSMITTER MEASUREMENTS

Normal transmitter proof-of-performance measurements may be made with the BW-51. Frequency response, distortion, and noise measurements may be made through the rear panel AUDIO TEST jack J3. Five volts RMS is available at 100% modulation so that most distortion and noise analyzers may be used. Percent modulation is read on the MODULATION meter and percent carrier shift is read on the % CARRIER LEVEL DEVIATION meter.

MAINTENANCE

BW-51 CALIBRATION (Figure 1)

Test Equipment Required

- VTVM
- High frequency oscilloscope with 5" display
- Linear modulator, output level of, 5-10 volts RMS unmodulated (See NOTE)
- Low distortion oscillator

NOTE: The modulation meter and peak lights respond to peak values of modulation so that if there is distortion in the modulator, the peak indications will be the true peak values, i.e., the sum of the fundamental and the harmonics or distortion products. The most common mistake made in calibrating AM monitors is to adjust the modulation level until carrier shut-off is reached. This is defined as 100% negative and, indeed, it is 100% negative, but the positive value is not necessarily 100%. If the distortion is 3% at this level (typical of many transmitters), the positive value of modulation may be anywhere from 97% to 103%, depending on the phase of the harmonics, and the monitor will read this. For this reason, the monitor should be calibrated at just 100% negative on the negative indications and then the modulation backed off to 90% for the positive indications so they can be set in the region where the transmitter is more linear.

Modulation Meter Alignment

1. Turn power off and set mechanical zero on meters.
2. Turn power on and allow to warm up for 15 minutes.
3. With VTVM, measure voltage at U5 Pin 7. Voltage should be +15 volts, ± 0.5 volt. Adjust R30 for correct reading.
4. With VTVM, measure voltage at U5 Pin 4. Voltage should be -15 volts, ± 0.5 volt. Adjust R25 for correct reading.
5. Place Function switch in ZERO position and voltmeter at Pin 6 U5 and adjust R37 for zero volts.
6. Adjust R44 for zero on Modulation Meter.
7. Apply an RF level of 5-10 volts to RF input, and adjust Carrier Set to -0- deviation on Carrier meter. Connect oscilloscope at RF INPUT, 12, of monitor.
8. Apply a 1 KHZ tone to modulator and adjust level for just

100% negative modulation as observed on oscilloscope. Depress NEG on Function switch of BW-51. Monitor should indicate 100% modulation. If not, adjust METER AMP, R41, for correct reading. (See NOTE.)

9. Reduce modulation level to 90% on BW-51. Place Function switch in POS position. Monitor should indicate 90% modulation. If not, adjust NEG AMP, R36, for correct reading. (See NOTE.)

10. Place Function switch in CAL position. Monitor should indicate 100%. If not, adjust CAL, R14, for correct reading.

Peak Indicator Alignment

CARRIER OFF Indicator.

— Reduce CARRIER SET potentiometer to -30% or less on CARRIER LEVEL meter. CARRIER OFF indicator should be on. This is a fixed comparator and no adjustment is provided.

-100% Peak Indicator.

— Adjust CARRIER SET to -0- deviation on CARRIER LEVEL meter. Adjust modulation for 98% or greater. The -100% indicator should be on. If not, adjust -100%, R69, for correct indication.

PEAK MOD Indicator.

— Place Function switch in POS position. Adjust modulation level for 90% on BW-51. Adjust PEAK MOD potentiometer on front for 90%. (See NOTE.) If the PEAK MOD potentiometer R1 reads in error, the knob may be slipped to correct reading by loosening the two set screws and retightening after adjusting.

— The span of the PEAK MOD potentiometer may be checked by applying a 1 KHZ tone to the modulator and adjusting the modulation to 90% on the BW-51. Adjust PEAK MOD span potentiometer, R60, so that the percentage difference on the PEAK MOD potentiometer on the front panel is 50% when the modulation level is changed from 90% to 40%. Slip the knob as in previous step if it is necessary to correct the reading at 90% after the span has been adjusted.

+125% Peak Indicator.

— Place Function switch in CAL position. The +125% indicator should be on. If not, adjust +125%, R65, for correct indication.