

MONITORING DIODE UNIT

MI-19051-A



RADIO CORPORATION OF AMERICA
ENGINEERING PRODUCTS DEPARTMENT CAMDEN, N. J.

IB-36114

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MI-19051-A

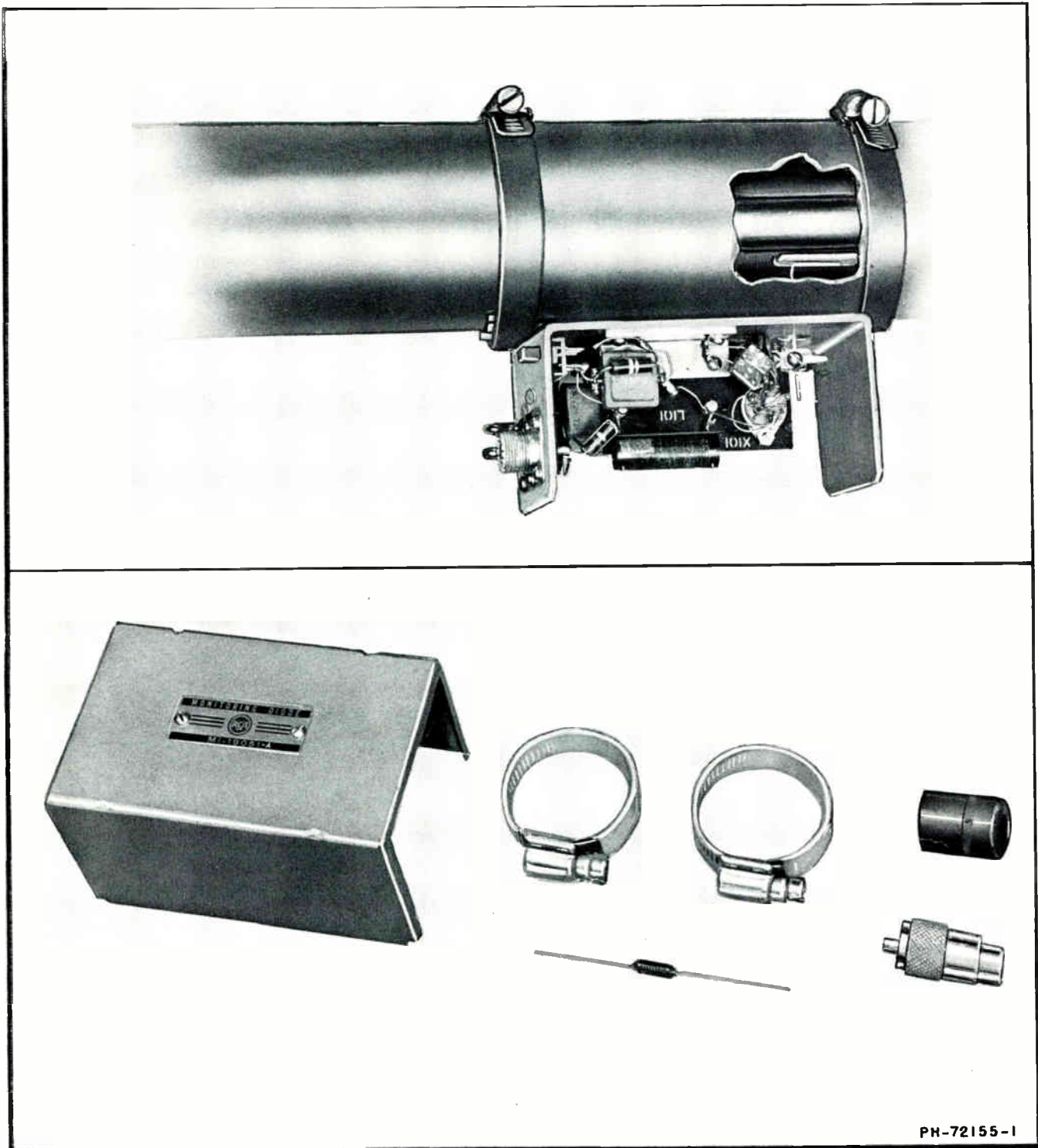
INSTRUCTIONS

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RCA VICTOR DIVISION

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PH-72155-1

Figure 1 - Typical Installation of Monitoring Diode Unit on 3-1/8 inch Transmission Line. (Line cut away to show pick-up probe.)

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TECHNICAL SUMMARY

ELECTRICAL SPECIFICATIONS

Frequency Range	Channels 2 to 13
Video Frequency Response	Uniform to 5 mc
Output Impedance	75 ohms
Output Voltage (75 ohms impedance).....	1.5 to 2 volts peak-to-peak at 85% modulation
Connections:	
Input Mounting (Coupling depth adjustable)	1-5/8 inch or 3-1/8 inch RTMA line
Output	Unbalanced 75-ohm coaxial cable
Input Power Requirements	115 volts, 50/60 cycles, 1 phase ac, 5 watts
Ambient Temperature (Maximum)	45° C

MECHANICAL SPECIFICATIONS

Width (including connectors)	7-5/16 inches
Height	2-3/4 inches
Depth	3-1/8 inches
Weight	3 pounds

TUBE COMPLEMENT

.....	1 - RCA type 6AL5
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EQUIPMENT LIST

The Monitoring Diode Unit, supplied as MI-19051-A, consists of the following items:

- 1 Monitoring Diode Unit, including tube and connectors in place
- 1 Additional Choke Coil (L102-A), for use on Channels 7 to 13
- 2 Cable Clamps, 3-1/8-inch
- 2 Cable Clamps, 1-5/8-inch

DESCRIPTION

The Monitoring Diode Unit, Figure 1, is designed to be used in conjunction with external test equipment for appraising television transmitter performance during tuning and operation. Mounted on either a 1-5/8-inch or 3-1/8-inch line, the Monitoring Diode Unit employs a pick-up probe and a duo-diode detector for sampling the transmitted video signal either ahead of or after the sideband filter.

During tuning, a long-time-constant circuit in the unit makes it possible to observe the video envelope on an oscilloscope synchronized with the video sweep generator. For use during operation, a switch on the unit disconnects the long-time-constant circuit so that the picture itself may be viewed on the associated monitor. Figure 3 is the schematic diagram for the diode unit.

For measuring the percentage or depth of modulation, an external "chopper" or vibrating relay such as RCA Stock Number 94077 is required. When properly connected this chopper will periodically short-circuit the 75-ohm portion of the load circuit to provide a zero reference level.

A power source of 115 volts, 50/60 cycles, single-phase ac is required to supply heater voltage for the one 6AL5 tube in the unit.

INSTALLATION

The Monitoring Diode Unit is supplied with two chokes, for the input circuit. Choke L102, *aka* colored green, is soldered in place and is intended for use on Channels 2 to 6. If the unit is to be used in the Channel 7 to 13 range, remove the unit cover, unsolder the green choke, and replace it with the blue choke, L102-A, which is packed with the cable clamps.

Mounting location for the unit is dependent upon the point to be monitored. This point, in a location where the ambient temperature does not exceed 45° C, may be in the transmission line either preceding the vestigial sideband filter or following it, depending upon the purpose for which the unit is to be used. When the transmitter includes a linear power amplifier, the diode unit may also be installed ahead of the power amplifier.

Installation of the unit requires that a 5/8-inch hole be drilled in the transmission line. This hole should be drilled in the bottom of the line so that the probe and chips or dirt will not fall into the line. Access to the unit for switch operation and tube replacement should be considered before selecting the mounting location.

Prior to mounting the unit, loosen the retaining clamp screw and remove the pick-up probe which is fastened inside the unit for protection during shipping. Reinsert the probe through the bottom of the unit and orient the probe to the position shown in Figure 1. The probe plate should be about one inch from the frame of the unit. Partially tighten the clamp screw. Using the appropriate cable clamps supplied, 1-5/8-inch or 3-1/8-inch, fasten the unit securely to the line as shown in Figure 1. Readjust the probe for minimum coupling or to the position where it just clears the inside of the transmission line outer conductor.

Connect the output jack, J101, to the monitoring equipment using RG-11/U cable and plug P101. Where the diode unit is intended for viewing the video waveform or picture on an oscilloscope or kinescope screen, the coaxial line should be terminated in a 75-ohm load.

Power for the unit should be taken from a point which will be energized only when the monitoring equipment is in operation, and connected to receptacle J102 through plug P102 supplied. The power source should be 115 volts, 50/60 cycles, single-phase ac.

Open S101 by operating the switch to the position nearest the power plug.

ADJUSTMENT AND TUNING

Energize the visual transmitter and modulate it with a picture or test pattern at a minimum of 85% modulation and normal peak power. Utilizing an oscilloscope for voltage measurement, note the unit output voltage. To increase the unit's output, deenergize the transmitter and move the probe closer to the transmission line inner conductor, then reapply power and note the voltage.

CAUTION

DO NOT PERMIT THE PROBE TO CONTACT THE INNER CONDUCTOR AT ANY TIME DURING TRANSMITTER OPERATION OR DAMAGE TO THE UNIT WILL RESULT.

Continue adjusting the probe until the output is approximately 1.5 volts. Do not exceed 2 volts.

The presence of excessive sound interference should now be checked. Operate the aural and visual transmitters at normal power output and modulate the visual transmitter with a picture signal. Objectionable sound interference in the picture will be indicated by a fine herringbone cross-hatch pattern on the kinescope screen, and a thickening of all horizontal traces on an oscilloscope. This condition is caused by sound energy being picked up by the diode probe and appearing in the monitored picture. If sound interference is marked, drill a second hole as follows:

Channels 2 to 6 - 9 inches from previous hole
Channels 7 to 13 - 3 inches from previous hole

Drill additional holes as required, using the relative pick-up in each hole as a guide in arriving at the sound null location.

When a chopper is part of the installation, energize the circuit and check its operation. A series of notches should appear on the waveform monitoring oscilloscope, the nulls of these notches indicating zero visual signal output. A horizontal white bar will be present on the monitor kinescope during operation of the chopper.

When the preceding adjustments and checks are completed, replace the unit cover. The diode unit is now ready for operation.

Where the unit is to be used for measuring the transmitter r-f envelope during video sweep modulation, operate switch S101 to the closed position - furthest from the power plug. Remove the 75-ohm termination. Connect J101 to an external oscilloscope, using a length of RG-11/U coaxial cable not in excess of 50 feet.

OPERATION

The Monitoring Diode Unit will be energized whenever the monitoring equipment is in operation.

During use of the unit as an aid in tuning or broadbanding the transmitter, the slide switch on the unit must be thrown to the closed position - furthest from the power plug. Utilizing a video sweep, the modulation envelope may be observed. Figure 2 depicts the ideal response curve at the output of the sideband filter.

For picture monitoring the switch must be in the opposite position - nearest the power plug.

Energizing the chopper circuit, if used, will enable modulation depth or per cent modulation to be measured.

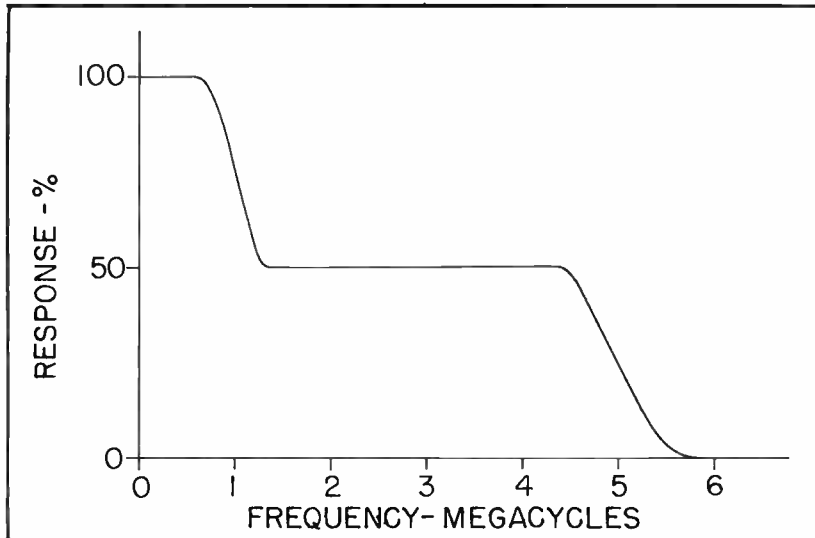


Figure 2 - Ideal Demodulated Sweep Waveform
from Output of Vestigial Sideband Filter

MAINTENANCE

Maintenance on the diode unit requires only occasional cleaning and the checking of the 6AL5 tube. A log of tube life will tend to anticipate replacement and prevent failure during operation.

REPLACEMENT PARTS AND ENGINEERING SERVICE

When ordering replacement parts, please give symbol, description, and stock number 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.

The following tabulations list service parts, electron tube, and field engineering service ordering instructions according to the geographical location of the station.

SERVICE PARTS

STATION LOCATION	OBTAIN SERVICE PARTS FROM
Continental United States or Alaska	Local Broadcast Equipment Sales Representative, his office, or directly from the Service Parts Order Service, Bldg.60, 19th and Federal Streets, Camden 5, N. J. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg.60, Camden, N.J. (Telephone: Woodlawn 3-8000).
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Local Broadcast Equipment Sales Representative, or Service Parts Order Service, RCA International Division, Gloucester, New Jersey. U.S.A.

ELECTRON TUBES

STATION LOCATION	OBTAIN ELECTRON TUBES FROM
Continental United States or Alaska	Local Distributor or nearest of the following warehouses: 34 Exchange Place Jersey City 2, New Jersey 589 E. Illinois Street Chicago 11, Illinois 420 S. San Pedro Street Los Angeles 13, California
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Local Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York. U.S.A.

If for any reason, it is desired to return tubes, please return them to the place of purchase. If this is not convenient, please notify your RCA serving warehouse so that Return Authorization may be forwarded to you.

PLEASE DO NOT RETURN TUBES DIRECTLY TO RCA WITHOUT AUTHORIZATION AND SHIPPING INSTRUCTIONS.

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given.

When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

FIELD ENGINEERING SERVICE*

STATION LOCATION	REQUEST FIELD ENGINEERING SERVICE FROM
Continental United States or Alaska	Local Broadcast Equipment Sales Representative or the RCA Service Company, Inc., Communications Service Division, Camden, N.J. Telephone: Gloucester 3-4560; emergency service is provided through Woodlawn 3-8000.
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Chief Engineer RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

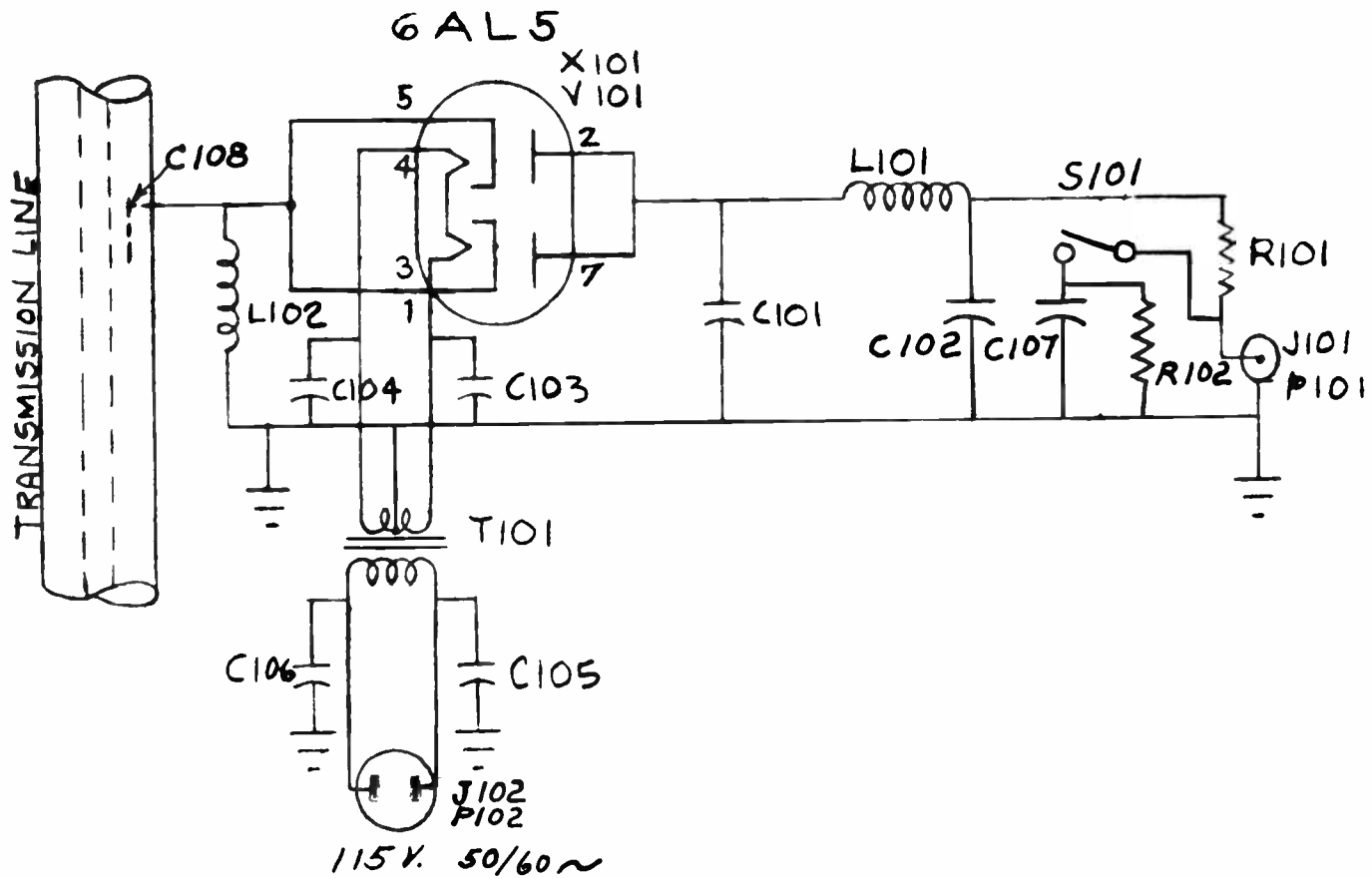
*Charges for field engineering service will be made at current rates.

PARTS LIST

FOR ORDERING INFORMATION SEE PAGE 8

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
C101, C102	Capacitor, 8 mmf $\pm 10\%$	K-90581-307	55387
C103, C104	Capacitor, 470 mmf $\pm 10\%$	P-727851-139	57926
C105, C106	Capacitor, 1500 mmf $\pm 10\%$	P-727866-151	39656
C107	Capacitor, 10,000 mmf	P-727865-71	92036
C108	Probe, r-f pickup	A-8898778-501	
J101	Connector, coaxial	P-727215-3	51800
J102	Connector, male, 2 contacts	K-891356-1	48743
L101	Coil assembly	A-8898780-501	58632
L102	Choke (green)	K-8886161-3	57023
L102-A	Choke (blue)	A-8898641-1	58097
P101	Connector, coaxial	K-252868-1	66344
P102	Connector, female, 2 contacts	K-67089-2	4573
R101	Resistor, 1000 ohms $\pm 10\%$, 1 watt	P-727836-62	71916
R102	Resistor, 100,000 ohms $\pm 10\%$, 1 watt	P-727836-86	503410
S101	Switch, slide, DPDT	A-861109-1	37314
T101	Transformer	B-949113-1	65613
X101	Socket, tube	K-99198-4	56382

Figure 3 - Schematic Diagram, Monitoring Diode Unit (P-740454)



P-740454



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