

Westinghouse

TYPE JY CARRIER MODULATORS STYLES 867994 and 1352436

INSTRUCTIONS

CAUTION

Before working on this equipment, turn off the power supply.

APPLICATION

The chief function of these Units is to connect together by means of relays the various circuits which may start and stop the carrier transmitter, and to provide a convenient point for connecting a portable push-to-talk handset for communication over the carrier channel. Means is also provided for introducing attenuation into the carrier receiver input circuit for sleet detection. A large number of terminals is provided so that the various relays may be arranged in a number of different ways for controlling the transmitter. These Units are intended to work with the other Units of a Carrier Equipment Assembly from a 125 or 250 volt-d-c supply, which may be either a station battery or a rectifier.

CONSTRUCTION AND OPERATION

The outline dimensions of these Units are shown in Fig. 1. All of the electrical parts are on the rear of the panel, which mounts on the swinging rack of any Type JY Power Line Carrier cabinet. The handset jacks and sleet test pushbutton are operated from the front of the panel. Adjustable and removable resistors are conveniently located on the rear of the Unit.

The electrical circuits of the Style 867994 and Style 1352436 modulators are shown in Fig. 2. These two Units are the same except that Style 1352436 has one less auxiliary contact on the jacks. Therefore, the description of Style 1352436 applies to the description of Style 867994. Either of these units uses accessory style 867998 for operation from 100 - 150 volts d-c, or accessory style 867999 for operation from 200 - 300 volts d-c.

The "Electrical Parts List" gives details of all the electrical components, for the basic units style 867994 and style 1352436 as well as for the accessories style 867998 and style 867999.

For push-to-talk operation, insert the handset plug into the jacks, keeping the edge marked TOP uppermost. To signal the distant station, press the push button. This sends out a carrier signal which will ring the bell at the distant station.

When the operator at that station inserts his handset into the Modulator jacks, his bell will stop ringing. When he presses his handset button, an audible tone will usually be heard in the handset receiver. This is caused

by the heterodyne between the local and distant transmitters and indicates that the far transmitter is sending out carrier. The conversation can now be started. Be sure to release the push button when not talking, as when both transmitters are energized at the same time, interference with communication may occur.

If the channel is operating on two frequencies, separated 10% or more, simultaneous transmission from both ends causes no objectionable interference, and the push button can be pressed continuously if desired.

The effect of sleet, snow, etc., accumulating on the power transmission line is to attenuate the carrier signal coming over the line. Comparative readings of the carrier receiver detector plate current under different conditions will serve as indications of the line attenuation under those conditions. Line switching, and other factors independent of the weather, will also alter the attenuation; therefore, these factors should be the same for sleet tests as they were during the original adjustments on this Unit.

To make a sleet test, where this Unit is used with the TRF Type JY double Receiver, transmit carrier from the far end of the line, then push the TEST button on this Unit. Read the receiver plate current with a meter plugged into receiver jack 1, or on the permanently mounted meter.

INSTALLATION

These units are usually supplied as part of a Type JY power line carrier equipment assembly. In these cases, it is shipped assembled with the other units in a cabinet, completely wired.

When the unit is shipped separately, proceed as follows: Unpack the unit and install it on a standard relay rack in the equipment assembly with which it is to be used, as near as possible to the carrier transmitter with which it is to operate. For mounting, use the fasteners in the cloth bag attached to the Unit.

Mount the accessory resistors in the empty fuse clips on the Unit. The resistor symbol is stencilled near the appropriate pair of clips and the resistor can be identified by reference to the Electrical Parts List, and the accessory packing list. Refer to the schematic diagram for the Equipment Assembly of which this Unit is to form a part, and make connections accordingly. The RF terminals for the sleet detector attenuator R-5 are the two porcelain posts at the end of the resistor panel. All the other terminals are located on the three vertical blocks at the side of the panel. Do not connect

TYPE JY CARRIER MODULATOR

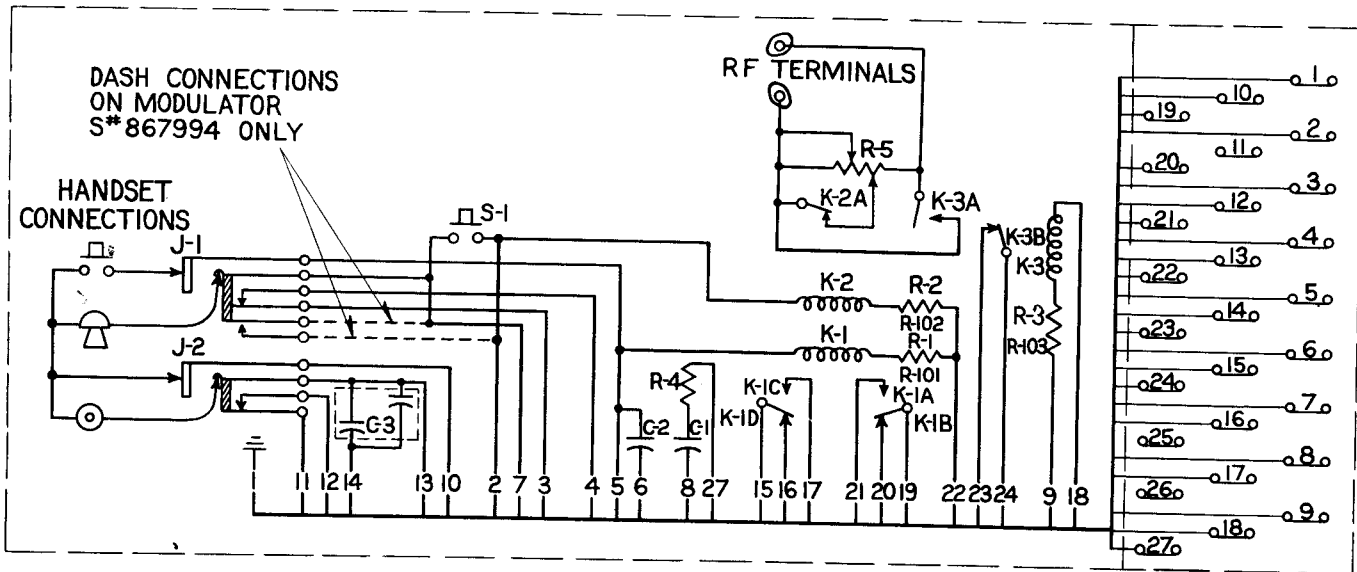


Figure 1
Internal Schematic of the Type JY Carrier Modulator.

more than two leads to any of these terminals. Ground terminal 1. Number 22 gauge wire is ample for any of the circuits in this Unit.

ADJUSTMENTS AND MAINTENANCE

The only adjustment to make on this unit is on the attenuator resistor R-5. Make this adjustment on a clear dry day, and under conditions of line switching which will result in a maximum received signal from the distant end of the carrier channel.

In the directions below, the resistor tap nearest to the main panel is referred to as tap A, and that furthest from the main panel as tap B. The relay contacts referred to are those shorting out all, or a portion of resistor R-5.

For operation with the Type JY double receivers proceed as follows:

- Move tap B as far away as possible from the main panel.
- With K-2 relay contacts closed, tune the receiver to resonance with carrier transmitted from the distant end of the line. Adjust the receiver coupling to critical.
- With K-2 relay contacts open, adjust tap A until the receiver plate current is approximately 18 milliamperes.

Be sure that the carrier transmitter at the far end is unmodulated during the adjustment, and has the same power output as will be used for subsequent sleet tests.

For operation with the Type JY double receivers when no sleet detection is required or for operation with the Type JY superheterodyne receiver, move both resistor taps as far away as possible from the main panel.

During regular maintenance periods, the contacts of the relays may be cleaned if necessary with a fine file. S#1002110 file is recommended for this purpose.

Remove the resistors from their mounting clips and clean the ferrules and clips with fine sandpaper to remove any corrosion.

If one of the relays fails to operate, check to see that there is the proper voltage across its coil. This should be between 15 and 25 volts on relay K1 - K2 coils and between 40 and 70 volts on relay K3 coil. Full line volts across the coil only, indicates an open circuit in the coil. Zero volts across the coil indicates either a short circuit in the coil, or an open circuit in the series resistor, provided supply voltage is available.

If the voltage on the coil is within the above limits, failure to operate indicates mechanical obstruction of some kind.

RENEWAL PARTS

When ordering renewal parts for this unit, include the following data from the name-plate.

- (1) The name of the unit.
- (2) the style or DL number.
- (3) the serial number.

TYPE JY CARRIER MODULATOR

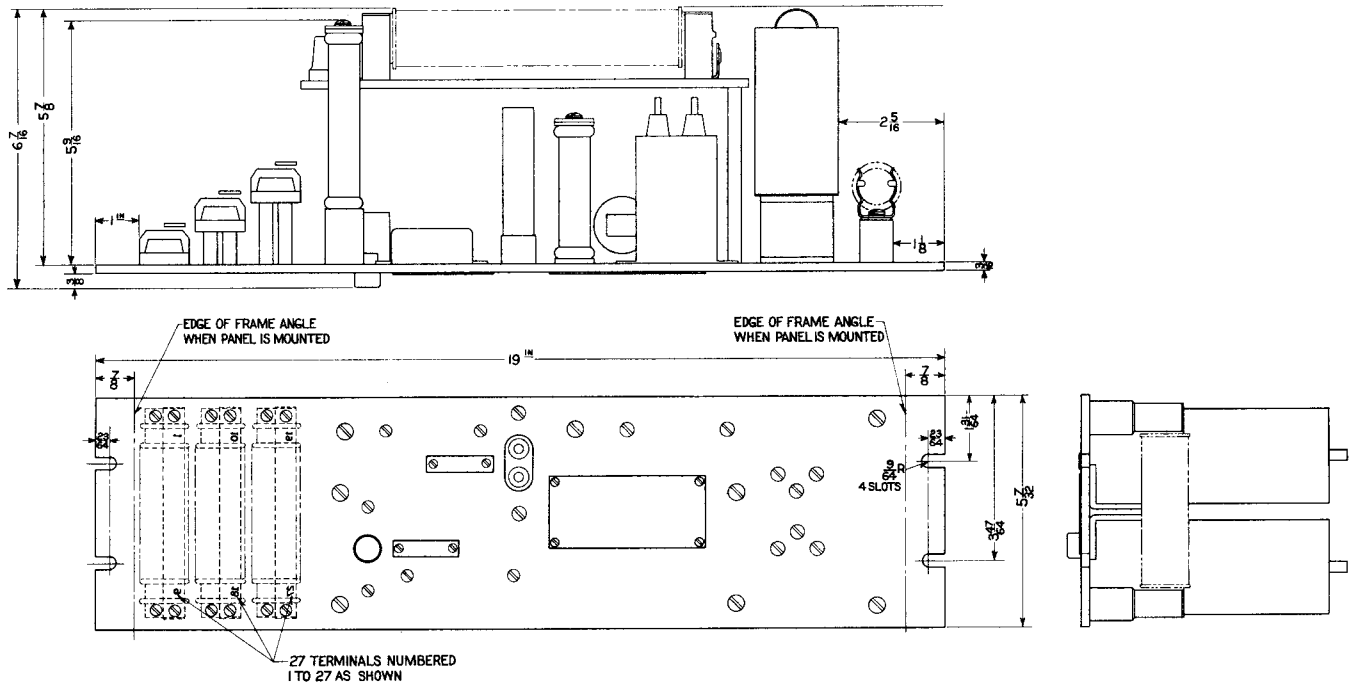


Figure 2
Outline of the Type JY Carrier Modulators. For Reference Only.

MODULATOR PARTS LIST

DIAGRAM SYMBOL		REQ'D.	FUNCTION	RATING
S#867994	S#1352436			
C-1	C-1	1	<u>CAPACITORS</u> Spark Suppressor	0.5 MFD., 600 V.d-c paper
C-2	C-2	1	Microphone By-pass	2.0 MFD., 600 V.d-c paper
C-3	C-3	1	Decoupling	0.1 x 0.1 MFD.
J-1		1	<u>JACKS</u> Modulation	One Circuit & One Make, 1 Break
J-2		1	Receiving	" " & " Break
	J-1	1	Modulation	" " & " "
	J-2	1	Receiving	" " & " "
K-1		1	<u>RELAYS</u> Transmitter Start	1 Amp, 300V. insulation
K-2		1	Attenuator	1 " " "
K-3	K-3	1	Attenuator Cut-Out	S#1164077
	K-1	1	Transmitter Start	Two Transfer Contacts
	K-2	1	Attenuator	" " "
R-4	R-4	1	<u>RESISTORS</u> Spark Suppressor	10,000 Ohms
R-5	R-5	1	Attenuator	2000 Ohms, Adjustable, 2 Bands
S-1	S-1	1	<u>SWITCHES</u> Test Push Button	

ACCESSORIES PARTS LIST

DIAGRAM SYMBOL				
#867998 100-150 V.dc	#867999 200-300 V.dc	REQ'D.	FUNCTION	RATING
<u>RESISTORS</u>				
R-1		1	Transmitter Start Relay	2000 Ohms
R-2		1	Attenuator Relay	2000 Ohms
R-3		1	Attenuator Cut-Out Relay	2000 Ohms
	R-101	1	Transmitter Start Relay	4000 Ohms
	R-102	1	Attenuator Relay	4000 Ohms
	R-103	1	Attenuator Cut-Out Relay	5000 Ohms



INSTALLATION • OPERATION • MAINTENANCE I N S T R U C T I O N S

TYPE JY CARRIER MODULATOR STYLE 1471821 FOR 125 OR 250 VOLT D.C. OPERATION

CAUTION Before working on this equipment, turn off the power supply, and ground or open circuit the R.F. lead.

APPLICATION

The function of this Unit is to connect together by means of relays the various circuits which may stop and start the carrier transmitter, and to provide a convenient point for connecting a portable push-to-talk handset for communication over the carrier channel. A large number of terminals is provided so that the circuits may be arranged in a number of different ways for controlling the transmitter. This Unit is designed to work with the other Units of a Carrier Equipment Assembly from a 125 or 250 volt d.c. supply, which may be either a station battery or a rectifier.

CONSTRUCTION AND OPERATION

The outline and mounting dimensions of this Unit are shown in Figure 2. All the electrical components are on the rear of the panel, which can be mounted on the swinging frame of any Type JY Power Line Carrier cabinet. The jack for the handset is mounted so that the plug is inserted from the front of the panel.

The electrical circuits are shown in Figure 1. Relay K-1 is used to control the carrier transmitter by means of the telephone handset pushbutton. Relay K-2 is used to remove the control of relay K-1 over the transmitter if the relaying channel functions at the same time that the communication channel is in operation. The handset is shown to indicate the connections to the jack. The handset is supplied as a separate unit.

The values and designations of the electrical components are given on the Electrical Parts List.

For push-to-talk operation, insert the handset plug into the jacks, keeping the edge marked TOP uppermost. To signal the distant station, press the push button. This sends out a carrier signal which will ring the bell at the distant station.

When the operator at that station inserts his handset into the Modulator jacks, his bell will stop ringing. When he presses his handset button, an audible tone will usually be heard in the handset receiver. This is caused by the heterodyne between the local and distant transmitters and indicates that the far transmitter is sending out carrier. The conversation can now be started. Be sure to release the push button when not talking, as when both transmitters are energized at the same time, interference with communication may occur.

If the channel is operating on two frequencies, simultaneous transmission from both ends causes no objectionable interference, and the push button can be pressed continuously if desired.

The Equipment Assembly instruction book gives the connections for the Unit. Note that the Resistors R-2, R-3 and R-5 are shorted for operation on a 125 volt d.c. supply. Remove the short from each of these resistors for operation on a 250 volt d.c. supply.

INSTALLATION

This Unit is usually supplied as part of a Type JY Power Line Carrier Equipment Assembly.

TYPE JY CARRIER MODULATOR

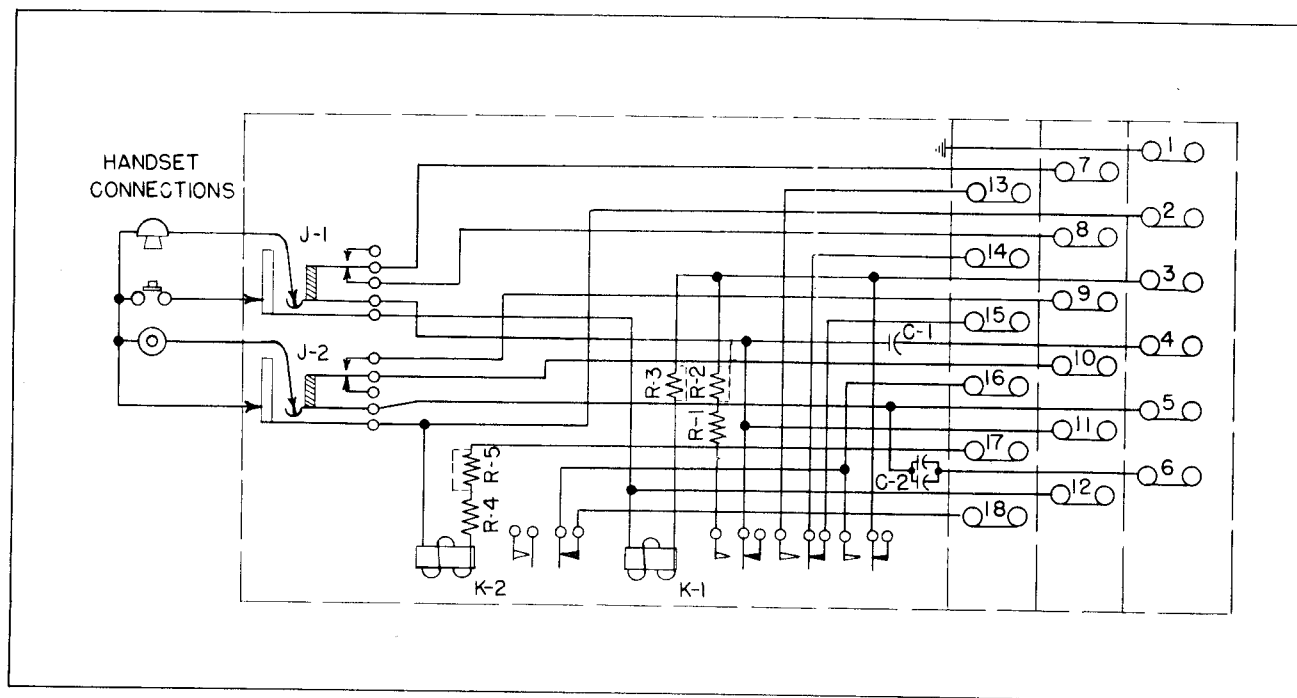


Fig. 1—Internal Schematic of Type JY Modulator.

In these cases it is shipped assembled with the other units in a cabinet, completely wired and no further work is necessary for installation of the individual Unit.

In cases where the Unit is shipped separately from an assembly, proceed as follows: Unpack the box and check its contents carefully against the shipping list, the order, or the requisition for the equipment. Do not discard the packing material until all parts have been found. Inspect the Unit carefully for damaged parts. Report any damage or shortage immediately to both the transportation company and the nearest Westinghouse District Office.

Install the Unit on the rack for the assembly with which it is to be used. For further instructions on installation, refer to the instruction book for the Equipment Assembly with which this Unit is to be used.

MAINTENANCE

As a part of the regular maintenance procedure the contacts of the relays should be inspected. If an examination shows that the contacts require cleaning, a very fine file

should be used. S#1002110 file is recommended for this purpose.

If one of the relays fails to operate, check to see that there is the proper voltage across its coil. This should be between 15 and 25 volts on relay K1 coil and between 40 and 70 volts on relay K2 coil. Full line volts across the coil only, indicates an open circuit in the coil. Zero volts across the coil indicates either a short circuit in the coil, or an open circuit in the series resistor, provided supply voltage is available.

If the voltage on the coil is within the above limits, failure to operate indicates mechanical obstruction of some kind.

RENEWAL PARTS

When ordering renewal parts for this unit, include the following data from the nameplate.

- (1) The name of the unit.
- (2) The style or DL number.
- (3) The serial number.

MODULATOR PARTS LIST

Diagram Symbol	Req'd	Function	Rating
<u>CAPACITORS</u>			
C-1	1	Microphone By-pass	10.0 MFD., 220 V.a.c.
C-2	1	Decoupling	0.1 x 0.1 MFD, 600V.d.c.
<u>JACKS</u>			
J-1	1	Modulation	one circuit and one break-make
J-2	1	Receiving	one circuit and one break-make
<u>RELAYS</u>			
K-1	1	Transmitter Control	S#2-D-29-RR-5DDD-10/6
K-2	1	Plate Supply Cutoff	S#1164077
<u>RESISTORS</u>			
R-1	1	Microphone Series	2000 ohms
R-2	1	Microphone Series	2000 "
R-3	1	Relay Series	8000 "
R-4	1	Relay Series	2000 "
R-5	1	Relay Series	3100 "
			REF. T-7619807

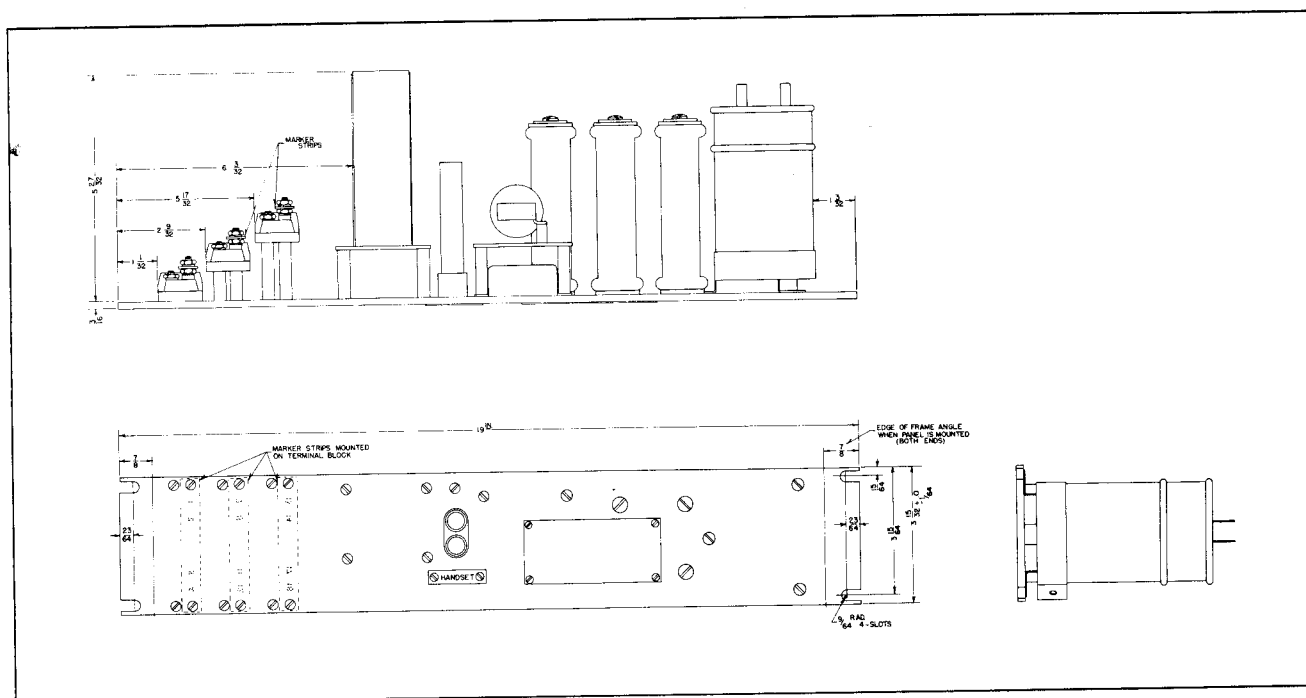


Fig. 2—Outline of the Type JY Modulator. For Reference Only.



WESTINGHOUSE ELECTRIC CORPORATION
METER DIVISION

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