

CLASS C INSTRUCTION MANUAL
FOR
TYPE SWP-125-2
SWITCHING PANEL

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Table 1-1. Type SWP-125-2 Switching Panel, Specifications

Input Power	115 V ac, 50-400 Hz
Power Consumption.	22 watts, approximately
Weight	16 pounds
Dimensions	3.5 inches high, 19 inches wide, and 14.25 inches deep.*

* Measured from back of front panel to rear panel.

1.1 ELECTRICAL CHARACTERISTICS

The Type SWP-125-2 Switching Panel is designed to provide a means of making signal and control connections between the various units of a receiving system.

The switching panel uses four coaxial relay-operated connection banks, each with eight input jacks and one output jack. The relay bank connectors and cables have a 50 Ω characteristic impedance. During operation, the output jack of any given relay bank is always connected to one of the input jacks. Front panel rotary wafer switches control the portions of the relays. 21.4 MHz DEMODULATOR switch S1A controls K1; SIGNAL MONITOR switch, S2 controls K2; LO switch S4A controls K3; and 160 MHz DEMODULATOR switch S3A controls K4. An unregulated 26 V ac relay-activating voltage from rectifier CR1-CR2 is connected to the wiper of each of the four switches. Various other switch sections are included for the switching of tuner AGC, DAFC (digital automatic frequency control), and frequency counter range and preset codes. The unit is supplied with a plug which can be wired for the desired range and preset coding.

1.2 MECHANICAL CHARACTERISTICS

The Type SWP-125-2 Switching Panel is designed for mounting in a standard 19-inch rack. All controls and the power line fuse are mounted on the front panel. The chassis and top and bottom covers are constructed of aluminum. The front panel is painted with gray enamel and overlaid with a black-anodized bezel which is etched with control markings. All input and output connectors are mounted on the rear panel with exception of the frequency counter range and preset jack which is mounted on the main deck.

1.3 EQUIPMENT SUPPLIED

The equipment supplied consists of the Type SWP-125-2 Switching Panel and the range/preset coder plug.

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

The Type SWP-125-2 Switching Panel is designed for a RS-125-(X) receiving system application.

1.5 UNPACKING AND INSPECTION

1.5.1 Examine the shipping carton for damage before the equipment is unpacked. If the carton has been damaged, try to have the carrier's agent present when the equipment is unpacked. If not, retain the shipping carton and padding material for the carrier's inspection if damage to the equipment is evident after it has been unpacked.

1.5.2 See that the equipment is complete as listed on the packing slip. Contact Watkins-Johnson Company, Gaithersburg, or your Watkins-Johnson representative with details of any shortage.

1.5.3 The unit was thoroughly inspected and factory adjusted for optimum performance prior to shipment. It is, therefore, ready for use upon receipt. After uncrating and checking contents against the packing slip, visually inspect all exterior surfaces for dents and scratches. If external damage is visible, inspect all internal components for apparent damage.

1.6 INSTALLATION

1.6.1 Rack/Mounting Support. - Rack mount equipment, manufactured by WJ-Gaithersburg, is designed for assembly in standard 19-inch racks in accordance with MIL-STD-189, or E.I.A standard RS-310. The unit may be supported solely by the front panel (3.5 inch and larger) for static installations, but it is recommended that chassis slides be added for ease of assembly, access to the unit, and to provide additional support for general installations. Mobile installations of the equipment should be evaluated on an individual basis. Additional information, such as recommended mounting methods, may be found in WJ-Gaithersburg Application Note 1302.50.

1.6.2 Thermal Considerations. - WJ-Gaithersburg equipment is designed for operational temperatures between 0 °C and +50 °C (32 °F to 122 °F). The operational temperature range is further qualified for free, unrestricted ambient air at sea level pressure. Equipment installation should provide for free flow of air around and through ventilated units. Multiple stacking, in particular, close adjacent stacking of electronic equipment in a standard console can produce an appreciable increase in the ambient air temperature for the units as compared to the ambient air in the vicinity of the console. Forced-air ventilation may be necessary to maintain the proper ambient air temperature in a console which accommodates equipment that contributes to a high thermal density.

1.6.3 Power Connection. - Connect the power plug to a 115 V 50-400 Hz source. The third pin on the power plug supplies a safety ground connection. If the two-pin to three-pin adapter must be used, be certain that the ground wire of the adapter is securely connected to a low impedance ground.

1.6.4 K1J1 through K1J9 (21.4 MHz Demodulator). - These BNC connectors provide 21.4 MHz demodulator input and outputs. K1J9 is the output jack.

1.6.5 K2J1 through K2J9 (Signal Monitor). - These BNC connectors provide signal monitor input and outputs. K2J9 is the output jack.

1.6.6 K3J1 through K3J9 (LO). - These BNC connectors provide LO (local oscillator) input and outputs. K3J9 is the output jack.

1.6.7 K4J1 through K4J9 (160 MHz Demodulator). - These BNC connectors provide 160 MHz demodulator input and outputs. K4J9 is the output jack.

1.6.8 Jack J1 (AGC In, NB). - This BNC connector provides the narrow-band AGC input from a tuner such as a DM-4(X).

1.6.9 Jack J2 (AGC out). - This 9-pin Winchester connector provides the tuner narrow-band or wide-band AGC output.

1.6.10 Jack J3 (DAFC out). - This 9-pin Winchester connector provides the DAFC input and outputs. Pin A is the input connection.

1.6.11 Jack J4 (External Range/Preset Control). - This 9-pin Winchester connector normally provides the frequency counter preset range and preset output.

1.6.12 Jack J5 (AGC in, W-B). - This BNC connector provides the wide-band AGC input from a tuner such as a DM-112 or DM-212A.

1.6.13 Jack J6 (Preset Coder). - This internally-mounted 56-pin connector accepts the preset plug supplied with the unit.

1.6.14 Jack J7 (External Range/Preset Control). - This 9-pin Winchester connector normally accepts range/preset codes from a tuner.

1.6.15 Range/Preset Codes Plug. - If the plug supplied with the unit is not wired for the particular application, refer to Table 1-2 for range and preset frequencies for the tuners and counters used in various RS-125-(X) systems.

1.7 OPERATION

1.7.1 21.4 MHz DEMOD Switch. - Positions 1 through 8 select K1J1 through K1J8 respectively. This switch also

1.7.2 160 MHz DEMOD Switch. - Positions 1 through 8 select K4J1 through K4J8 respectively.

1.7.3 SIGNAL MONITOR Switch. - Positions 1 through 8 select K2J1 through K2J8 respectively.

1.7.4 LO and DAFC Switch. - Positions 1 through 8 select K3J1 through K3J8 respectively for LO selection. This switch also selects the DAFC output pins on J3 and the frequency counter preset code on J4.

1.7.5 Tuner AGC Switch. - Select the N-B position for AGC connections from a narrowband demodulator; the W-B position should be selected when a wideband demodulator is in use.

1.8 PREPARATION FOR RESHIPMENT AND STORAGE

1.8.1 If the unit must be prepared for reshipment, the packaging methods should follow the pattern established in the original shipment. If retained, the original materials can be reused to a large extent or will, at a minimum, provide excellent guidance for the repackaging effort.

Table 1-2. Tuner and Counter Range/Preset Connections

TUNER					COUNTER				
Type	Range (MHz)	Pin No.	Preset (MHz)	Pin No.	Type	Range (MHz)	Pin No.	Preset (MHz)	Pin No.
WJ-9080A	30-120	J10-D	160	J10-H	Note 1	20-300	J1-D	160	J1-H
	120-150	J10-C	160	J10-H		200-500	J1-C	160	J1-H
	500-1000	J10-B	160	J10-H		500-1000	J1-B	160	J1-H
UT-1000	None (Note 2)	---	None	---	Note 3	200-500	J1-C	60	J1-F
						500-1000	J1-B		
VT-30	None	---	None	---	Note 4	20-300	J1-D	21.4	J1-J
VT-11	None	---	None	---	Note 4	20-300	J1-D	60	J1-F
HT-10	None	---	None	---	Note 4	20-300	J1-D	21.4	J1-J

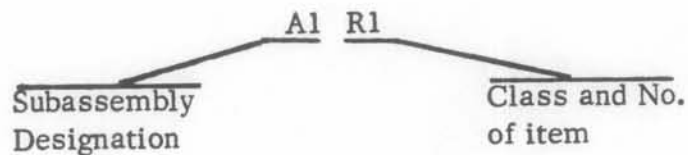
- Notes:
1. Requires special counter such as DRO-333-1 to provide 160 MHz preset.
 2. Special circuitry required to switch counter range.
 3. DRO-309A or DRO-333 required to count above 500 MHz.
 4. DRO-309A, DRO-302B, DRO-333, or DRO-315.

1.8.2 Conditions during storage and shipment should normally be limited as follows:

- (a) Maximum humidity: 95% (no condensation)
- (b) Temperature range: -30 °C to +85 °C

1.9 UNIT NUMBERING METHOD

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules), and parts. An example of the unit method follows:



Identify from right to left as: First (1) resistor (R) of first (1) subassembly (A)

As shown on the main chassis schematic, components which are an integral part of the main chassis have no subassembly designation.

1.10 REFERENCE DESIGNATION PREFIX

Partial reference designations have been used on the equipment and on the illustrations in this manual. The partial reference designations consist of the class letter(s) and identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Reference Designation Prefixes are provided on drawings and illustrations in parenthesis within the figure titles.

1.11 LIST OF MANUFACTURERS

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
14632	Watkins-Johnson Company 700 Quince Orchard Road Gaithersburg, Maryland 20760	71400	Bussman Manufacturing Division of McGraw-Edison Co. 2536 W. University Street St. Louis, Missouri 63107
15606	Cutler-Hammer, Inc. 4201 N. 27th Street Milwaukee, Wisconsin 53216	71700	General Cable Corporation Cornish Wire Company Division 101 Water Street Williamstown, Mass. 01267
56289	Sprague Electric Company Marshall Street North Adams, Mass. 01247	74868	Bunker Ramo Corporation The Amphenol RF Division 33 East Franklin Street Danbury, Connecticut 06810

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
72619	Dialight Corporation Division of Digitronics Corp. 60 Stewart Avenue Brooklyn, New York 11237	81312	Winchester Electronics Division Litton Industries Incorporated Main Street & Hillside Avenue Oakville, Connecticut 06779
75915	Littelfuse, Incorporated 800 E. Northwest Highway Des Plaines, Illinois 60016	95146	Alco Electronics Products, Inc. 3 Wolcott Avenue Lawrence, Massachusetts 01843
80131	Electronic Industries Association 2001 Eye Street, N. W. Washington, D. C. 20006		

1.12 PARTS LIST

The parts list which follows contains all electrical parts used in the equipment and certain mechanical parts which are subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the type and serial number of the equipment and the reference designation and description of each part ordered. The list of manufacturers provided in paragraph 5.3 and the manufacturer's part number for components are included as a guide to the user of the equipment in the field. These parts may not necessarily agree with the parts installed in the equipment, however, the parts specified in this list will provide satisfactory operation of the equipment. Replacement parts may be obtained from any manufacturer as long as the physical and electrical parameters of the part selected agree with the original indicated part. In the case of components defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

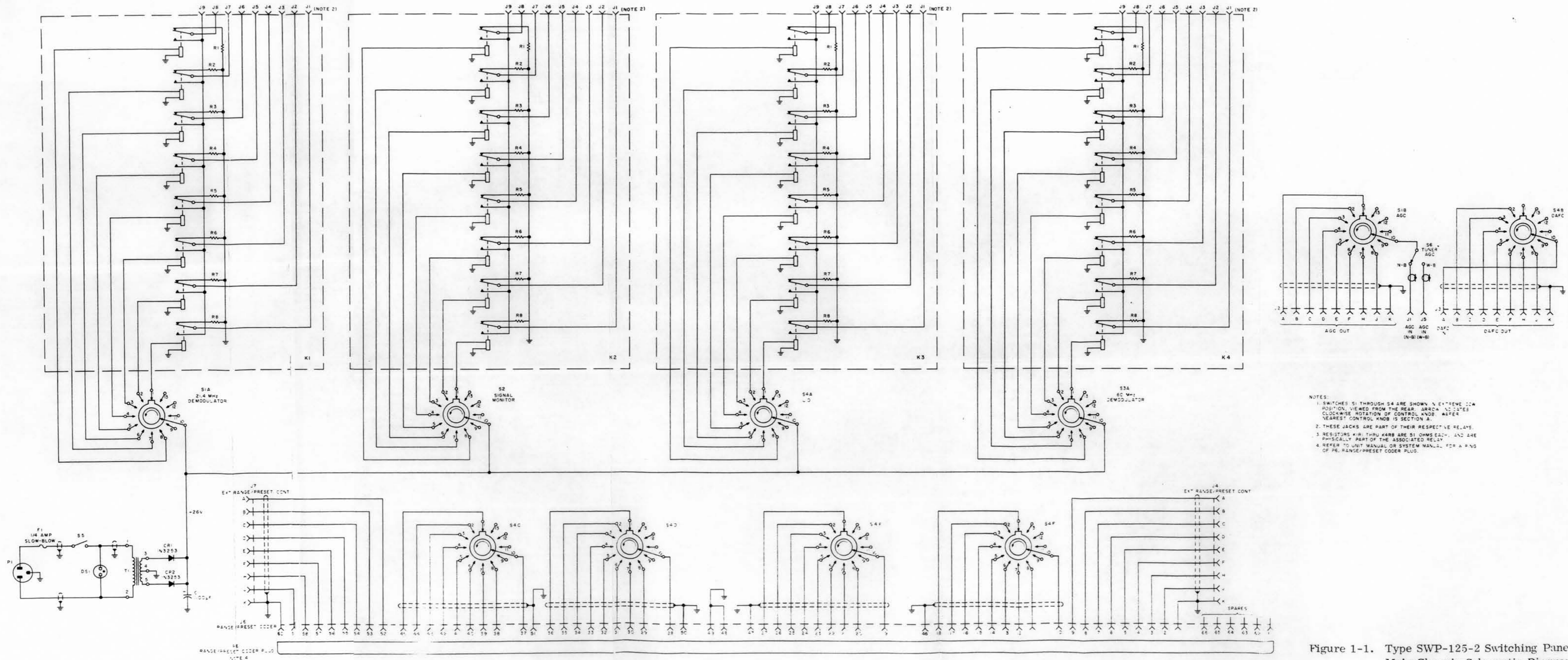
NOTE

As improved semiconductors become available it is the policy of Watkins-Johnson to incorporate them in proprietary products. For this reason some transistors, diodes and integrated circuits installed in the equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

REF SIG	DESCRIPTION	QTY. PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
3	Same as S1				
4	SWITCH, MODIFIED	1	1128-63	14632	
5	SWITCH, TOGGLE: SPST	1	8280-K16	15605	
6	SWITCH, TOGGLE	1	MST115D	95146	
T1	TRANSFORMER	1	15240	14632	
KF1	FUSEHOLDER	1	342004	75915	

1.12.1 Type SWP-125-2 Switching Panel

REF ESIG	DESCRIPTION	QTY. PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, ELECTROLYTIC, ALUMINUM: 1100 μ F, -10+75%, 40 V	1	39D118G040HL4	56289	
CR1	DIODE	2	1N3253	80131	
CR2	Same as CR1				
DS1	LAMP, NEON	1	249-7866-1431-534	72619	
F1	FUSE, 3AG, SLOW-BLOW: 1/4A	1	MDL-1/4	71400	
J1	CONNECTOR, JACK, BNC SERIES	2	17825-1002	74868	
J2	CONNECTOR, RECEPTACLE, MULTIPIN	4	MRE-9S-G7	81312	
J3	Same as J2				
J4	Same as J2				
J5	Same as J1				
J6	CONNECTOR, RECEPTACLE	1	MRA66SG7	81312	
J7	Same as J2				
K1 thru K4	RELAY, COAXIAL	4	329-11545-3	74868	
P1	CONNECTOR, PLUG AND POWER CORD	1	3598-181-007	71700	
P2 thru P5	NOT USED				
P6	CONNECTOR, PLUG	1	MRA66PG7H9	81312	
S1	SWITCH, MODIFIED	3	1128-62	14632	
S2	Same as S1				



- NOTES:
1. SWITCHES S1 THROUGH S4 ARE SHOWN IN EXPOSED POSITION, VIEWED FROM THE REAR. ARROWS INDICATE CLOCKWISE ROTATION OF CONTROL KNOB. WAFER NEAREST CONTROL KNOB IS SECTION A.
 2. THESE JACKS ARE PART OF THEIR RESPECTIVE RELAYS.
 3. RESISTORS R1R THRU R8R ARE 51 OHMS EACH, AND ARE PHYSICALLY PART OF THE ASSOCIATED RELAY.
 4. REFER TO UNIT MANUAL OR SYSTEM MANUAL FOR A PINNING OF R8, RANGE/PRESET CODER PLUG.

Figure 1-1. Type SWP-125-2 Switching Panel Main Chassis Schematic Diagram