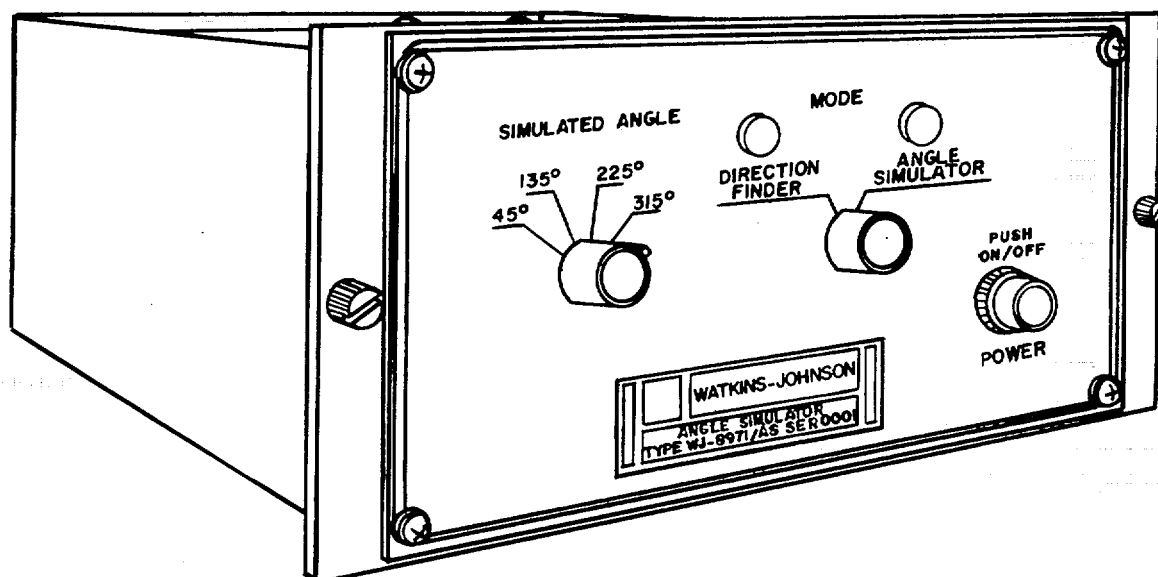


TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL



SIMULATOR, ANGLE, DIRECTION FINDER,
SM-843/G
(NSN 5820-01-203-9920)

SAFETY SUMMARY

These general precautions should be followed whenever working with electronic equipment to prevent injury to personnel:

1. Do not work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid.
2. Whenever possible, turn off the power supply to the equipment before beginning maintenance on the equipment.
3. Do not remove the protective covers to the equipment unless you are authorized to do so.
4. When the technicians are aided by operators, they must be warned about dangerous areas. A periodic review of safety precautions in TB 385-4, Safety Precautions for Maintenance of Electrical/Electronic Equipment, is recommended.
5. Seek advice from your supervisor whenever you are in doubt about electrical safety conditions.
6. For Artificial Respiration, refer to FM 21-11.

PROPRIETARY STATEMENT

This document and subject matter disclosed herein are proprietary items to which Watkins-Johnson Company retains the exclusive right of dissemination, reproduction, manufacture, and sale.

This document is provided to the individual or using organization for their use alone in the direct support of the associated equipment unless permission for further disclosure is expressly granted in writing.

A/(B blank)

Operator, Organizational,
Direct Support and General Support
Maintenance Manual

**SIMULATOR, ANGLE, DIRECTION FINDER SM-843/G
(NSN 5820-01-203-9920)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5000. A reply will be furnished direct to you.

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SECTION 0**INTRODUCTION****0.1 SCOPE****0.1.1 TYPE OF MANUAL**

This Simulator, Angle, Direction Finder SM-843/G Manual is an Operator's, Organizational Direct Support and General Support Maintenance commercial manual.

0.1.2 MODEL NUMBERS AND EQUIPMENT NAMES

The Simulator, Angle, Direction Finder SM-843/G is used with Receiver Set, Radio AN/TRQ-37. In this manual, the Simulator, Angle, Direction Finder SM-843/G will be referred to as the WJ-8971/AS Angle Simulator. A complete cross reference of common equipment names and nomenclature used in the manual is provided in paragraph 0.7.

0.1.3 PURPOSE OF EQUIPMENT

The purpose of the Simulator, Angle, Direction Finder SM-843/G is to verify the operational status of the Direction Finder Indicator ID-2380/G and to be used as a digital alignment tool (maintenance).

0.2 CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

0.3 MAINTENANCE FORMS, RECORDS AND REPORTS**0.3.1 REPORTS OF MAINTENANCE AND UNSATISFACTORY EQUIPMENT**

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

0.3.2 REPORT OF PACKAGING AND HANDLING DEFICIENCIES

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73B/AFR 400-54/MCO 4430.3H.

0.3.3 DISCREPANCY IN SHIPMENT REPORT (DISREP)(SF 361)

Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

0.4 DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

0.5 ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing equipment from administrative storage the PMCS should be performed to assure operational readiness. Preparation of equipment for shipment or limited storage is covered in **paragraph 2.4**.

0.6 TOOLS AND TEST EQUIPMENT

Refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit for tools used in the maintenance of the angle simulator. Test equipment required for troubleshooting and maintenance of the Compass Readout is listed in **paragraph 4.4**.

0.7 OFFICIAL NOMENCLATURE, NAMES AND DESIGNATIONS

The list below will help you identify the official nomenclature of the major equipment items used with the angle simulator. It also provides the common name used in the manual when it is different from the official nomenclature. Official nomenclature must be used when completing forms or when looking up technical manuals.

Common Name	Official Nomenclature
Direction Finder Antenna, WJ-9880-4	Antenna, AS-3778/G
Direction Finder, WJ-8971A-6 ID-2380/G	Direction Finder-Indicator
Radio Receiving Set	Receiver Set, Radio AN/TRQ-37
Receiver, WJ-8617B-5	Receiver, Radio R-2311/G
Compass Readout, WJ-390604	Indicator Unit, ID-2381/G
Compass	Magnetic Compass, Remote MX-10677/G

0.8 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

If your Angle Simulator needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communication-Electronics Command and Fort Monmouth, ATTN:

AMSEL-ME-MP, Fort Monmouth, NJ 07703-5000. We'll send you a reply.

0.9 WARRANTY INFORMATION

The Angle Simulator is warranted by Watkins-Johnson Company for a period of 1 year following delivery. It starts on the date found in block 23, DA Form 2408-9, in the logbook. This warranty may contain repair restrictions. Report all defects in material or workmanship to your supervisor.

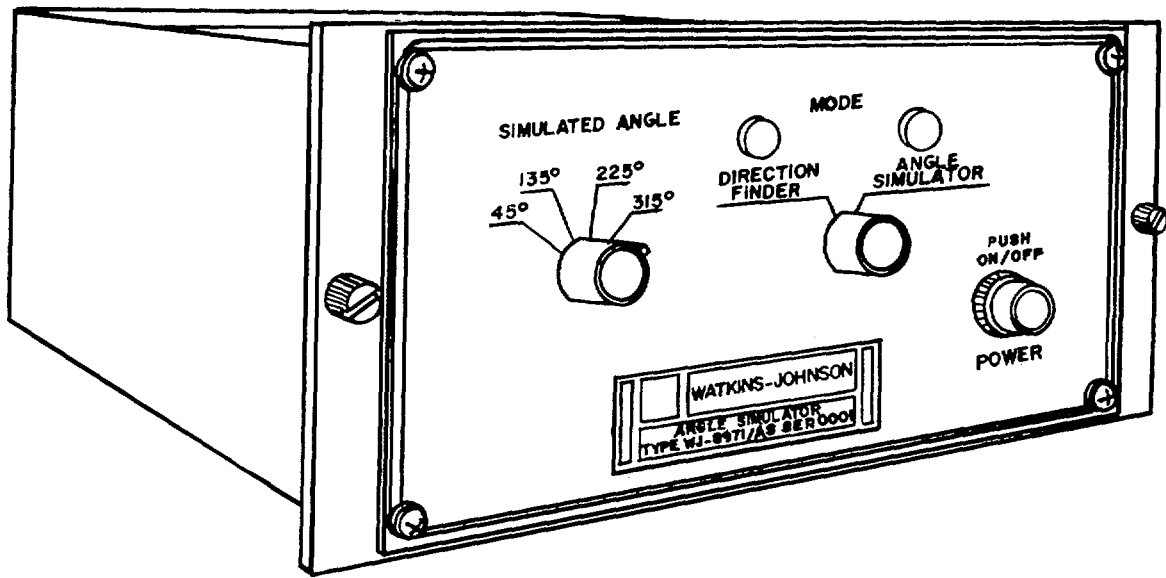


Figure 1-1. WJ-8971/AS Angle Simulator

SECTION I

GENERAL DESCRIPTION

1.1 ELECTRICAL CHARACTERISTICS

The WJ-8971/AS Angle Simulator is designed to be used in conjunction with Receiver Set Radio, AN/TRQ-37 and the WJ-8971 Series Direction Finders. It provides a 21.4 MHz IF Signal with a switchable simulated 45 degrees, 135 degrees, 225 degrees, or 315 degrees angle. Power requirements are 115/230 volts AC, 47-440 Hz.

1.2 MECHANICAL CHARACTERISTICS

The components of the unit are contained in an aluminum chassis designed for half rack mounting using an EF-201D (or equivalent) mounting frame. The printed circuit board is mounted horizontally on stand offs from the chassis bottom. The power supply is mounted on stand offs from the circuit board. All controls are mounted on the front panel. All input and output connections are mounted on the rear panel.

1.3 EQUIPMENT SUPPLIED

The equipment supplied with the WJ-8971/AS Angle Simulator includes two electrical cables to pass the 21.4 MHz IF signal from the Receiver to the DF Processor and to transmit control signals to the Direction Finding Antenna.

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

The WJ-8971/AS Angle Simulator works in conjunction with the Receiver Set, Radio AN/TRQ-37. This system includes the:

- | | |
|----------------|---|
| 1) WJ-8617B-5 | VHF/UHF Receiver |
| 2) WJ-8971A-6 | Direction Finder |
| 3) WJ-390604 | Compass Readout |
| 4) WJ-390602 | Signal Distribution Panel |
| 5) WJ-8977-2/M | Intercom Master and WJ-8977-2/R Intercom Remote |
| 6) WJ-390606 | Spectrum Display select |
| 7) WJ-390643 | Intercept Antenna 101 Remote Magnetic Compass |
| 8) WJ-390618 | Signal Entrance Panel 1 |
| 9) WJ-390644 | Signal Entrance Panel 2 |
| 10) WJ-390621 | Signal Entrance Panel 4 |
| 11) S-9203A | Speaker Unit |
| 12) PD-603 | Spectrum Display |

Table 1-1. WJ-8971/AS Angle Simulator Specifications

Simulator Type	Angle Simulator for 8971A Series Direction Finder
Simulated Angles.....	45°, 135°, 225°, 315°
Angle Accuracy.....	±3°
Power	2 Watts
Operating Voltage.....	115/230 Vac 47 to 440 Hz
Dimensions (inches).....	3-1/2 H, 8W, 16D
Weight	6.0 lbs

SPECIFICATIONS NOTE

The specifications and the design of the type WJ- 8971/AS Angle Simulator as indicated in the preceding table are subject to change in accordance with modification improvements.

SECTION II

INSTALLATION AND OPERATION

2.1 UNPACKING AND INSPECTION

Examine the shipping carton for damage before unpacking the equipment. If the carton appears to be damaged, try to have the carrier's agent present when the equipment is unpacked. If this is not possible, retain all packaging material and shipping containers for the carrier's inspection to verify damage to the equipment after unpacking. Also verify that the equipment shipped corresponds to the packing slip. Contact the Watkins-Johnson Company, CEI Division or your Watkins-Johnson representative for any discrepancies or shortages.

2.2 INSTALLATION

Installation instructions for installing the WJ-8971/AS Angle Simulator in the Receiver, Radio Set AN/TRQ-37 are contained in TM 11-5820-938-12. For other applications, refer to the appropriate system technical manual.

2.3 EQUIPMENT MALFUNCTIONS

The WJ-8971/AS Angle Simulator was thoroughly inspected and adjusted for optimum performance prior to shipment. If any malfunctions are encountered after performing the recommended installation procedures, verify that the correct signals are present at the proper jacks. The schematic diagram in Section IV will aid in the maintenance and troubleshooting of the unit. To avoid possible voiding of the warranty, prior to taking any corrective maintenance action, contact your Watkins-Johnson representative or the Watkins-Johnson Company, CEI Division, Gaithersburg, Maryland.

2.4 OPERATION

Operation of the WJ-9880-4 Direction Finder Antenna coincides with the operation of the Receiver Set, Radio AN/TRQ-37. Refer to TM 11-5820-938-12 for a step by step operation of the Receiver Set, Radio. For other applications, refer to the appropriate system technical manual.

2.5 PREPARATION FOR RESHIPMENT

If the unit must be prepared for reshipment, the packaging methods should follow the patterns established in the original shipment. If retained, the original materials can be reused to a large extent or at least provide guidance for repacking.

2-1/(2-2 blank)

SECTION III

CIRCUIT DESCRIPTION

3.1 GENERAL

The circuitry found in the Simulator, Angle, Direction Finder SM-843/G is described in the following paragraph. **Figure 3-1** is an overall functional block diagram of the simulator, and the subsequent paragraph describes its operation. Note that the unit numbering method is used for electrical components, which means that parts on the subassemblies carry a prefix before the usual class letter and number of the item (such as AIR1 and A4Q1). These subassembly prefixes are omitted on illustrations and in the text except in those cases where confusion might result from their omission.

3.2 FUNCTIONAL DESCRIPTION

3.2.1 The WJ-8971/AS Angle Simulator is designed to operate as an accessory device with the WJ-8971 Series Direction Finders. Two cables interconnect the angle simulator with the Direction Finder set via rear panel connectors. It also receives 21.4 MHz WB IF signals from the Receiver and switches out the antenna control to the antenna. It permits an operator to confirm that the DF is working properly. There are two modes of operation: Direction Finder and Angle simulator. In the Direction Finder position the angle simulator allows the Direction Finder to operate in its normal mode. When in the angle simulator position, the angle simulator becomes the input to the DF, and normal DF operation ceases. The DF will accept either a 45-degree, 135-degree, 225-degree, or 315-degree 21.4 MHz signal. The four simulated signals produced by the angle simulator are selectable by a front panel control. The unit is designed to operate from 230 Vac or 115 Vac power source selectable by a switch on the rear panel.

During normal operation the angle simulator switches the IF output from the receiver to the Direction Finder signal input. It also receives the ANT control output from the DF and switches this signal to the antenna control input. In the angle simulator position, the antenna control input is switched internally to control the angle simulator circuitry thus eliminating the antenna control output to the antenna. The receiver IF input is switched off and replaced by the simulated angle produced by the angle simulator circuitry. Internally, an 85.6 MHz crystal oscillator is divided down by J-K flip-flops to four, 21.4 MHz signals, each 90 degrees out of phase with each other. These signals are switched through an analog switch at 800 Hz controlled by the antenna control lines. There is an internal delay circuit to compensate for delay time differences. The switched IF signals are then sent through a 21.4 MHz low-pass filter, amplified and connected to the DF signal input. The order in which the analog switch connects the four 21.4 MHz IF signals to the output determines the particular angle signal being produced.

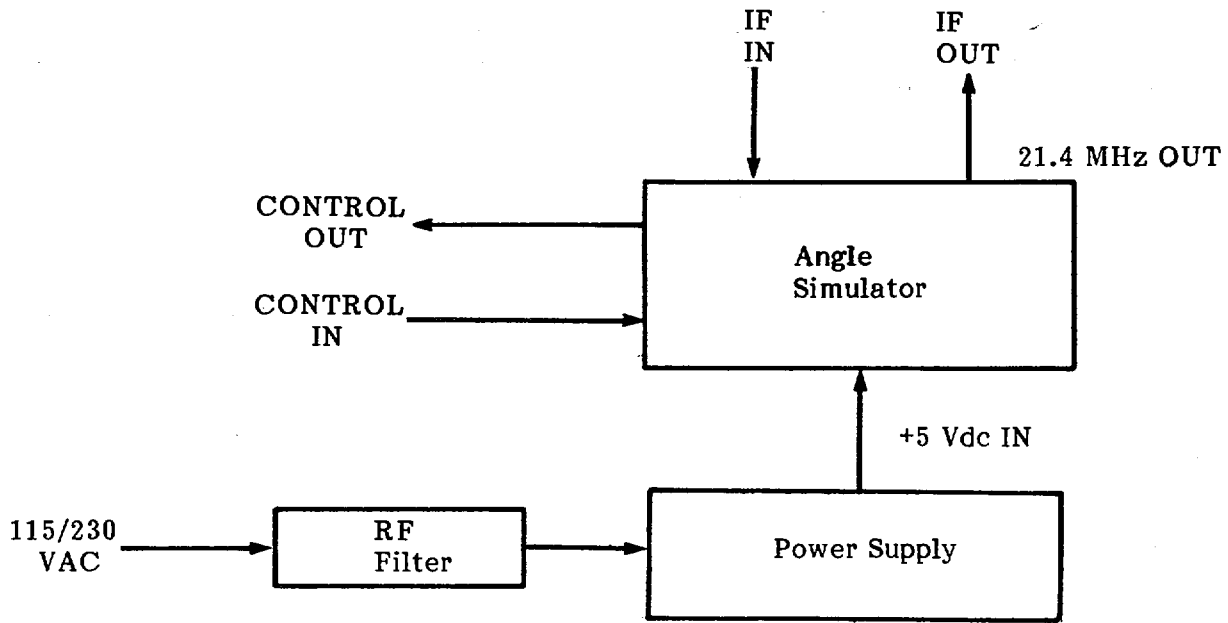


Figure 3-1. WJ - 8971/AS Angle Simulator Functional Block Diagram

SECTION IV

MAINTENANCE

4.1 GENERAL

The Angle Simulator has been conservatively designed to operate for extended periods of time with little or no routine maintenance. An occasional cleaning and inspection are the only preventive maintenance operations recommended. Intervals for the operations should be based on the operating environment. Should trouble occur, repair time will be minimized if the maintenance technician is familiar with Section III of this manual and with the schematic diagrams. Reference should also be made to the troubleshooting and maintenance procedures contained in this section. A complete parts list can be found in **Section V**.

4.2 CLEANING AND LUBRICATION

The unit should be kept free of dust, moisture, grease, and other foreign matter to ensure trouble-free operation. If available, use low-pressure compressed air to remove accumulated dust from the exterior and interior. A clean dry cloth, a soft bristled brush, or a cloth saturated with cleaning solution may also be used.

4.3 INSPECTION FOR DAMAGE OR WEAR

Many potential or existing troubles can be detected by a visual inspection of the unit. For this reason, a complete visual inspection should be made for indications of mechanical and electrical defects on a periodic basis, or whenever the unit is being checked for a reported trouble. Electronic components that show signs of deterioration should be checked and a thorough investigation of the associated circuitry should be made to verify proper operation. Mechanical parts should be inspected for excessive wear, looseness, misalignment, corrosion, and other signs of deterioration.

4.4 TEST EQUIPMENT REQUIRED

The following instruments, or their equivalents, are required to properly troubleshoot the Angle Simulator at both the direct support and depot maintenance levels:

- 1) Digital Multimeter, AN/PSM-45
- 2) Test Lead Set, Simpson Cat. No. 00577

4.5 TROUBLESHOOTING PROCEDURES

Troubleshooting efforts should first be directed towards localizing the problem. Once the trouble has been localized, the Angle Simulator can be returned to operating condition by substituting a spare module or subassembly known to be in good condition. Prior to performing corrective maintenance on the faulty module, the procedures followed up to this point should be reviewed to determine exactly why the failure affected the equipment in the manner it did. This review is necessary to make certain that the problem discovered is actually the cause and not just the result of the malfunction. Authorized direct support troubleshooting procedures begin on page 4-3. Any other symptoms require

depot level maintenance.

4.6 ASSEMBLY REMOVAL, REPAIR AND REPLACEMENT

The Angle Simulator assemblies are mounted in such a way as to permit easy accessibility/removal. Before the assembly is removed, any cable connections must be desoldered or disconnected. Repair procedures are straightforward and conventional.

**ANGLE SIMULATOR WITH POWER
LAMP THAT DOES NOT LIGHT**

INITIAL SETUP

Test Equipment

- Multimeter, Digital
- Test Lead Set

AN/PSM-45
Simpson Catalog No. 00577

Equipment Condition

Angle Simulator
connected to 115 vac
power source.

Power Switch "ON".

No power on light, no
readout, confirms
symptom.

Tools

Tool Kit, Electronic

TK-105G

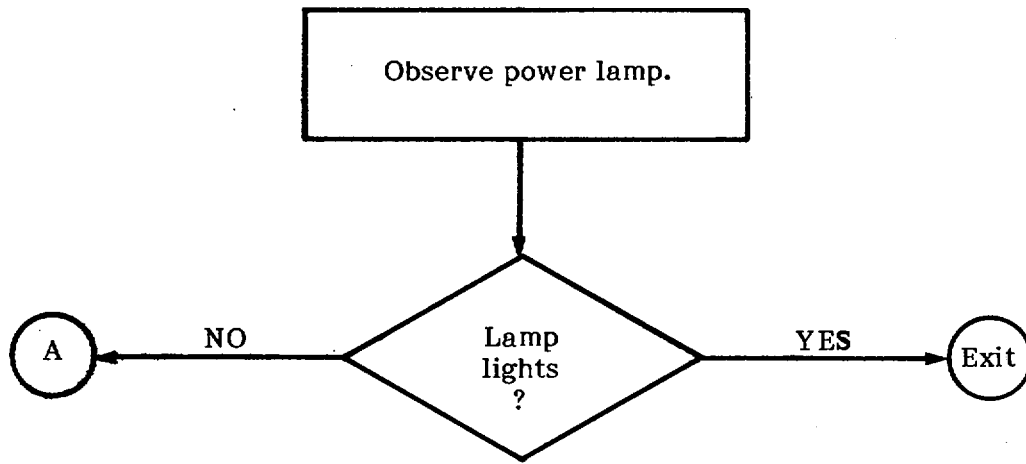
Replacement Parts

None

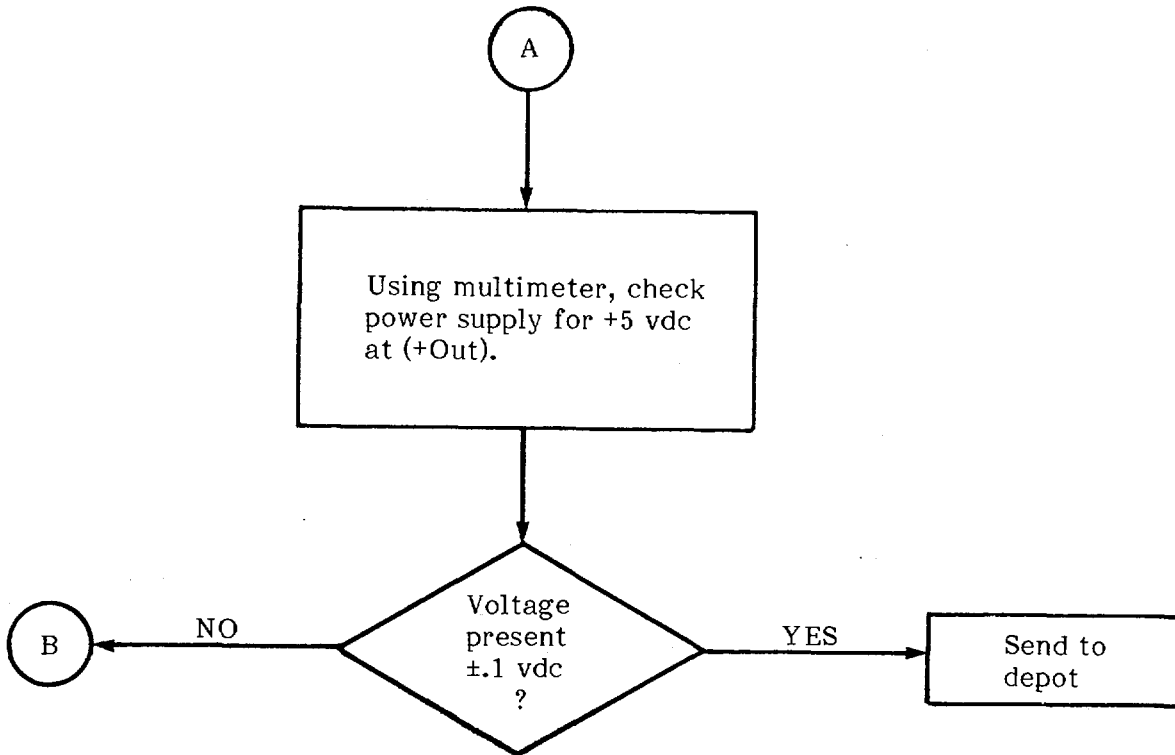
General Safety Instructions

None

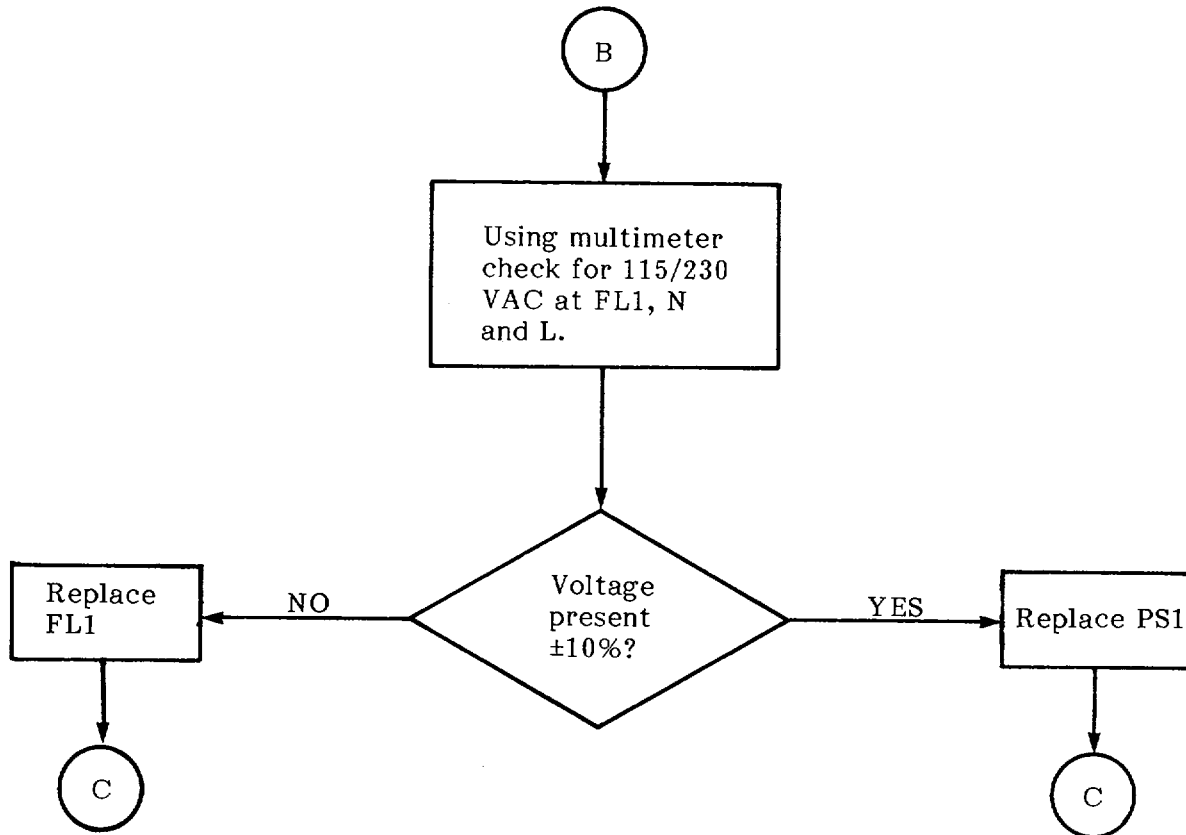
POWER LAMP DOES NOT LIGHT



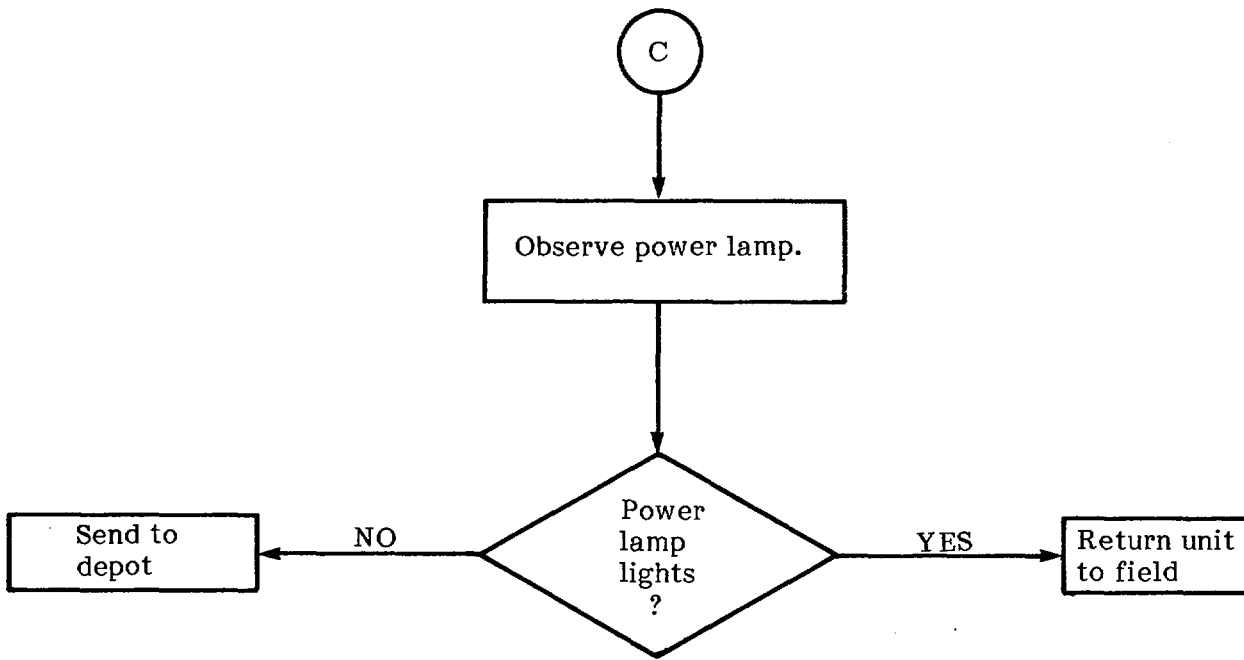
POWER LAMP DOES NOT LIGHT-Continued



POWER LAMP DOES NOT LIGHT-Continued



POWER LAMP DOES NOT LIGHT-Continued



4-7/(4-8 blank)

SECTION V

REPLACEMENT PARTS LIST

5.1 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:

<u>Subassembly Designation</u> <u>Al</u>	<u>R1</u> <u>Class and No. of Item</u>
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.

5.2 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 parentheses within the figure titles.

5.3 LIST OF MANUFACTURERS

<u>Mfr.</u>	<u>Code</u>	<u>Name and Address</u>	<u>Mfr.</u>	<u>Code</u>	<u>Name and Address</u>
00779		Amp, Inc. P.O. Box 3608 Harrisburg, PA 17105	09021		Arco Electronics Bradford, PA 16701
08108		Lamp Industry for use with industry designations for lamps	05245		Components Corp. Chicago, ILL 60657
14632		Watkins-Johnson Company CEI Division Gaithersburg, Maryland 20878	08717		Sloan Co. Sun Valley, CA 91352
54407		Power-One Camarillo, California 93010	16428		Belden Corp. Richmond, IN 47374
80058		Joint Electronic Type Designation System	71400		Bussman Mfg Division McGraw-Edison Company St Louis, Missouri 63107

<u>Mfr.</u> <u>Code</u>	<u>Name and Address</u>	<u>Mfr.</u> <u>Code</u>	<u>Name and Address</u>
81073	Grayhill, Inc. 561 Hillgrove Ave. LaGrange, IL 60528	96906	Military Standards
87034	Macro-Oak Industry Division of Oak Electro/Netics Corp Anaheim, California 92803		

5.4 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 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.

NOTE

As improved semi-conductors become available, it is the policy of Watkins-Johnson Company 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 list and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

5.5 WJ-8971/AS ANGLE SIMULATOR

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A 1	Antenna Switch	1	791783-2	14632	
A2	Angle Simulator	1	371030-2	14632	
DS1	Lamp/Neon	1	AH	08108	
DS2	Lamp/LED	1	4G0	08717	
DS3	Lamp/LED	1	4A0	08717	
FLI	Filter	1	6J4	05245	
F1	Fuse, Cartridge: 1/4 AMP, 3AG	1	MDL1/4	71400	
J1	Connector, Receptacle	1	MS3112E10-6P	96906	
J2	Connector, Receptacle	1	MS3112E10-6S	96906	
J3	Connector, Receptacle P/O W1	2	225398-7	00779	
J4	Same as J3 P/O W2				
PS1	Power Supply	1	HA5-1.2/OVP	54407	
P1	Connector, Plug P/O W2	3	UG1465/U	80058	
P2	Same as P1 P/O W1				
P3	Same as P1				
R1	Resistor, Fixed, Composition: 27Ω, 5%, 1/2W	1	RCR20G273JR	81349	01121
R2	Resistor, Fixed, Film: 130Ω, 5%, 1/4W	2	CF1/4-130 OHMS/J	09021	
R3	Same as R2				
S1	Switch, Pushbutton	1	671-6-1	87034	
S2	Switch, Rotary	1	9S30-01-6-2N	81073	
S3	Switch, Rotary	1	9S30-01-304N	81073	
W1	Cable Assembly	1	17300-344-1	14632	
W2	Cable Assembly	1	17300-344-2	14632	
XD, S1	Part of S1				
XD, S2	Lamp Assembly/LED Green	1	122B-GL-QB-4G0	08717	
XD, S3	Lamp Assembly/LED Amber	1	122B-OL-QB-4A0	08717	
*	Cable Assembly	1	271356-1	14632	
	Cable Assembly	1	17300-344-3	14632	
	Power Line Cord	1	17250	16428	
*	Accessory items supplied with WJ-8971/AS				

APPENDIX A

REFERENCES

SECTION I. INTRODUCTION

A-1. SCOPE

This appendix lists all the forms, field manuals, technical manuals and miscellaneous publications that apply to the Angle Simulator. Only those publications available to, and required by operators and organizational maintenance personnel are listed.

A-2. FORMS

Discrepancy in Shipment Report..... SF 361

Quality Deficiency Report..... SF 368

Recommended Changes to Equipment
 Technical Manuals..... DA Form 2028-2

Report of Discrepancy..... SF 364

A-3. FIELD MANUALS

First Aid for Soldiers..... FM 21-11

A-4. TECHNICAL MANUALS

Procedures for Destruction of Electronics
 Materiel to Prevent Enemy Use (CECOM)..... TM 750-244-2

Receiver Set, Radio AN/TRQ-37..... TM 11-5820-938-12

Operator, Organizational, Direct Support and
 General Support Maintenance Manual, Receiver,
 Radio R-2311/G..... TM 11-5820-936-14-1

Operator, Organizational, Direct Support and
 General Support Maintenance Manual, Signal
 Monitor, WJ-794103-1..... TM 5820-936-14-1-1

Operator, Organizational, Direct Support and
 General Support Maintenance Manual, Direction
 Finder, Indicator ID-2380/G..... TM 11-5820-936-14-2

Operator, Organizational, Direct Support and
 General Support Maintenance Manual,
 Intercommunication Units LSA-672/G and
 LS-673/G..... TM 11-5820-936-14-4

Operator, Organizational, Direct Support and
 General Support Maintenance Manual, Antenna
 AS-3773/G TM 11-5820-936-14-5

Operator, Organizational, Direct Support and
 General Support Maintenance Manual,
 ID-2381/G TM 11-5820-936-14-3

A-5. MISCELLANEOUS PUBLICATIONS

The Army Maintenance Management
 System (TAMMS) DA Pam 738-750

Consolidated Index of Army Publications
 and Blank Forms DA Pam 25-30

Safety Precautions for Maintenance of
 Electrical/Electronic Equipment TB 385-4

Report of Packaging and Handling Deficiencies AR 735-11-2

Reporting of Transportation Discrepancies in
 Shipment AR 55-38

Painting and Preservation Supplies Available
 for Field Use for Electronics Command
 Equipment SB 11-573

Safety Measures to be Observed When Installing
 and Using Whip Antennas, Field-Type Masts, Towers
 and Antennas and Metal Poles that are Used
 with Communications, Radar and Direction
 Finder Equipment TB 43-0129

APPENDIX B

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1. GENERAL

This appendix provides a summary of the maintenance operations for the Indicator Unit ID-2380/G. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. MAINTENANCE FUNCTION

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item; part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

B-2. MAINTENANCE FUNCTIONS-Continued

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e. DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. COLUMN ENTRIES

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn, the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The number of task hours specified by the work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

- C Operator/Crew
- O Organizational
- F Direct Support
- H General Support
- D Depot

B-3. COLUMN ENTRIES-Continued

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tools sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetical code which leads to the remark in Section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. TOOL AND TEST EQUIPMENT REQUIREMENTS (SECTION III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5 digit) in parentheses.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS	
			C	O	F	H	D			
0106	Angle Simulator WJ-8971/AS	Test Test Replace Repair Repair		0.2	0.4 0.3			1.5 1.0	2-3 2-5, 7-19 1 6 6	O

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O	Tool Kit, Electronic Equipment, TK-100/G	5180-00-605-0079	
2	O, F, D	Multimeter, Digital, AN/PSM-45	6625-01-134-2512	
3	O, F, D	Test Lead Set, Simpson Catalog No. 00577	N/A	
6	F, D	Tool Kit, Electronic Equipment, TK-105/G	5180-00-510-8177	

SECTION IV. REMARKS

Reference Code	Remarks
0	Repair is accomplished by removal and replacement of the Power Switch (S1).

APPENDIX C

COMPONENTS OF END ITEM AND
BASIC ISSUE ITEMS LIST

SECTION I. INTRODUCTION

C-1. SCOPE

This appendix lists the basic issue items for the Simulator, Angle, Direction Finder SM-843/G to help you inventory items required for safe and efficient operation. There are no components of end items.

C-2. GENERAL

Section II, Basic Issue Items (BII) has the minimum essential items required to replace the Intercom System in operation, to operate it and to perform emergency repairs. Although packaged and shipped separately, BII must be with the Angle Simulator during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement basic issue items, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column 1 - National Stock Number. This column indicates the national stock number assigned to the item and will be used or requisitioning purposes.

b. Column 2 - Description, FSCM and Part Number. This column indicates the federal item name and, when applicable, a brief description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

c. Column 3 - Unit of Measure (U/M). This column indicates the measure used in performing the actual operation/maintenance function. This measurement is expressed by a two-character alphabetical abbreviation.

d. Column 4 - Quantity Required (Qty Rqd). This column indicates the quantity of the item authorized to be used with/on the equipment.

SECTION II. BASIC ISSUE ITEMS

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	(3) Unit of Measure	(4) Quantity Required
N/A	Publication N/S TM -11-5820-936-14-2-1, 80058, N/A	Ea.	1

NOTE:
1. RESISTOR VALUES 1/4W UNLESS OTHERWISE MARKED.

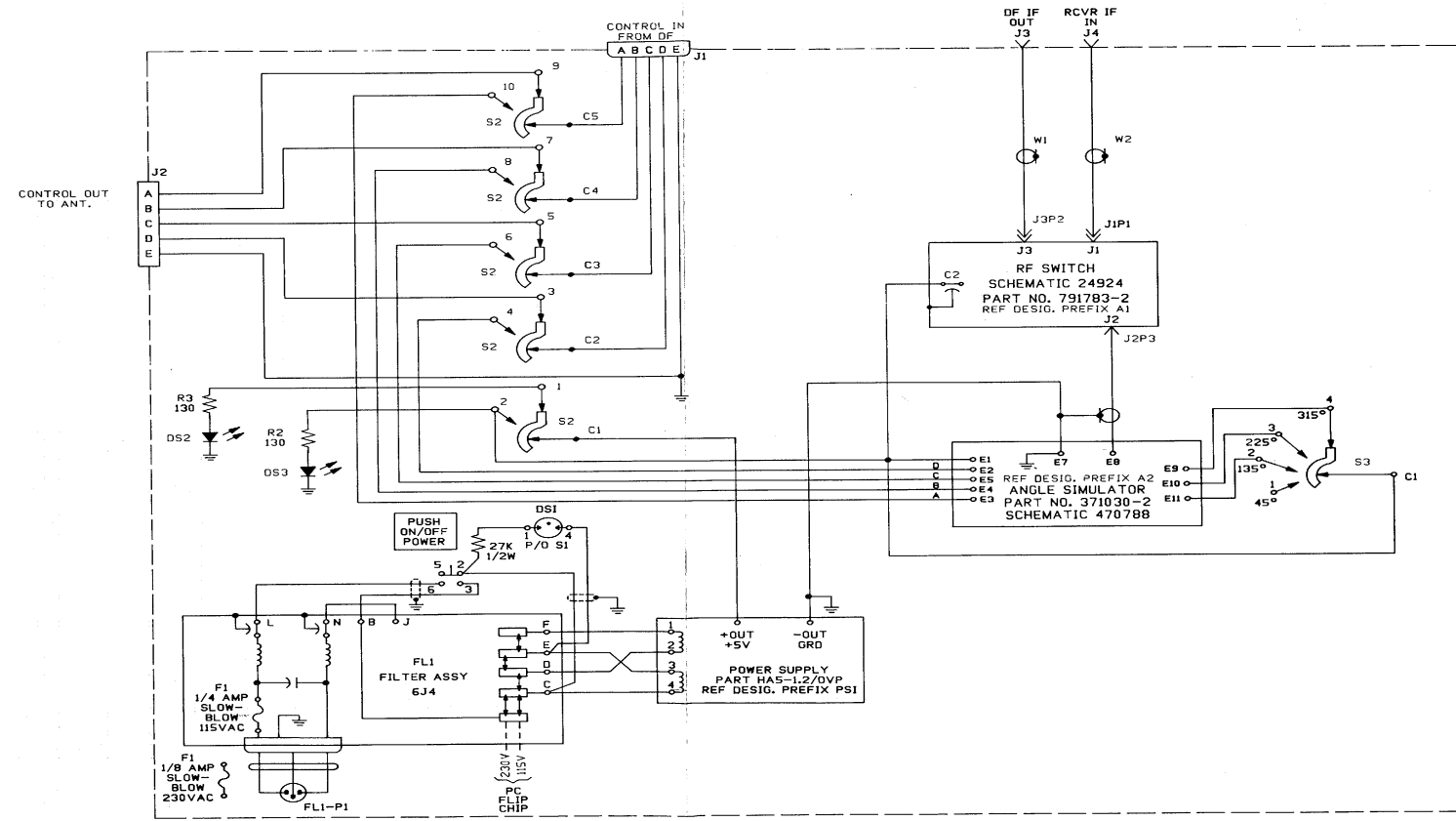


Figure 4-1. Type WJ-8971/AS Angle Simulator (Main Chassis) Schematic Diagram 470987

4-9/(4-10 blank)

Figure 4-1. Type WJ-8971/AS Angle Simulator (Main Chassis) Schematic Diagram 470987
4-9/(4-10 blank)

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