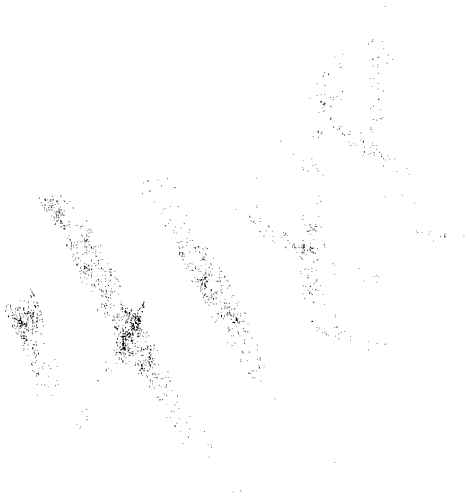


BIRD

INSTRUCTION book

MODEL 8454/55

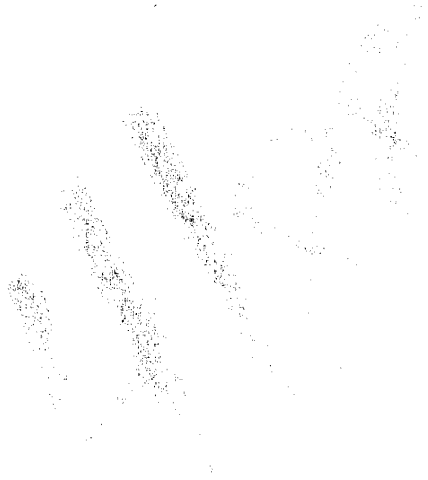
INSTRUCTION BOOK

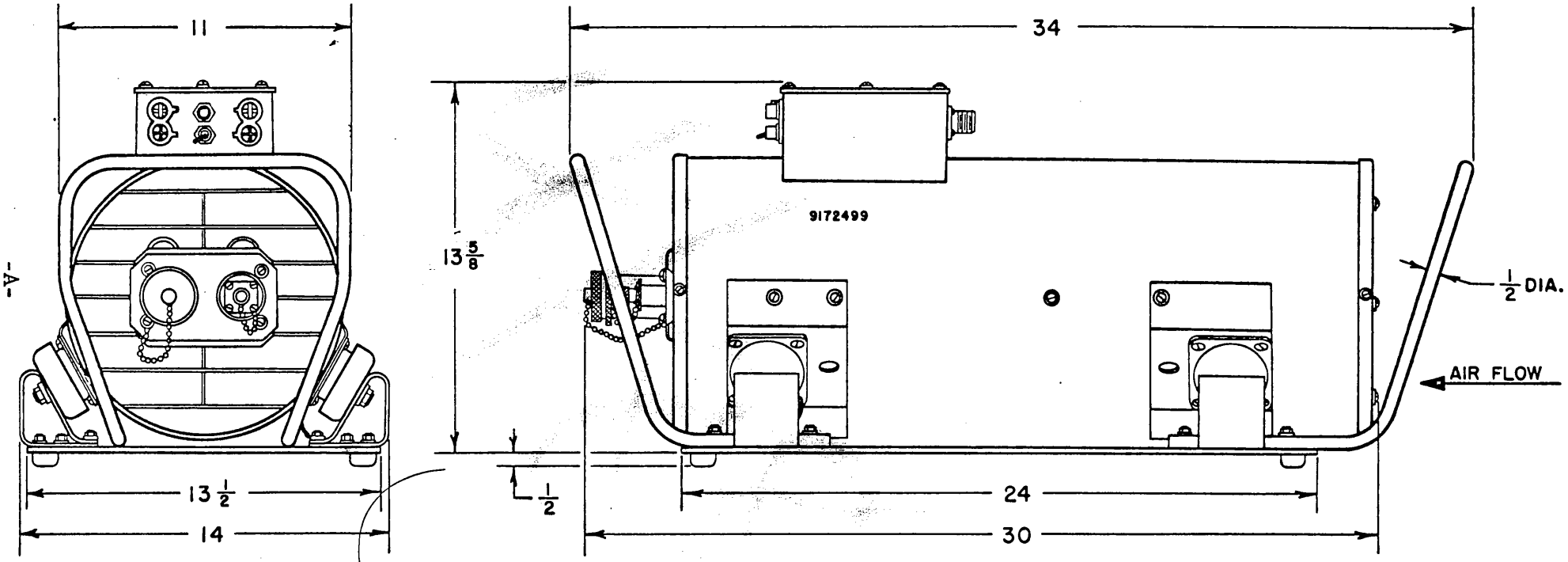
for

Model 8454/8455

TERMALINE®

DUMMY LOAD





Model 8454 - Outline Drawing

SUMMARY SHEET

ELECTRICAL

Load Power Rating	4500 Watts continuous
Pulse Power Rating	12 Kilovolts peak 5 Kilowatts average
Input Impedance	50 ohms
Input Connector	UG-37A/U (Pulse Type)
Monitoring Output	BNC, Female
Blower Operating Power	115v. AC 1.35 amp. 400 cycle
Operating Temperature Range	-20°C to +50°C

MECHANICAL

Cooling	Forced Air (self-contained blower)
Operating Position	Horizontal
Dimensions	34 in. Lg. 14 in. W. 13-5/8 in. H.
Weight	70 lbs.
Finish	Olive Drab semi-gloss Enamel

Bird Electronic Corp.
Cleveland, Ohio

Model 8454

Dummy Load

TABLE OF CONTENTS

ILLUSTRATIONS

SUMMARY SHEET

ELECTRICAL

Load Power Rating	3375 Watts continous
Pulse Power Rating	12 Kilovolts peak 5 Kilowatts average
Input Impedance	66.7 ohms
Input Connector	UG-37A/U (Pulse Type)
Monitoring Output	BNC, Female
Blower Operating Power	115v. AC 1.35 amp. 400 cycle
Operating Temperature Range	-20° C to+50° C

MECHANICAL

Cooling	Forced Air (self-contained blower)
Operating Position	Horizontal
Dimensions	34 in. Lg. 14 in. W. 13-5/8 in. H.
Weight	70 lbs.
Finish	Sand

Bird Electronic Corp.
Cleveland, Ohio

W A R N I N G

Because of very high voltages impressed on this equipment when in operation, be sure the equipment is properly grounded before using. Avoid placing hands inside louvers on front of the Dummy Load to prevent severe electrical shock.

MODEL 8454 DUMMY LOAD

SECTION I - GENERAL DESCRIPTION

The Model 8454 Dummy Load is used for the dissipation of high energy, pulsed power, generated by radar equipment.

The nominal input impedance of the unit is 50 ohms, non-inductive, with a minimum power rating of 4500 watts continuous and a maximum power dissipation of 5000 watts, absorbing a pulse load of 12 kilovolts. The pulse input jack is a large ceramic-insert connector, Type UG-37A/U. The BNC Type female output jack is capacitive-coupled to the load, and is used to monitor the input signal. Cooling of the unit is achieved by forced air from a self-contained blower.

The Dummy Load is self-contained in an all metal housing, including the blower and air filter. The load housing is cradled on four specially mounted heavy duty shock mounts which provide shock and vibration protection according to standard military specifications. The load housing is of a drip proof construction, and finished in an olive drab semigloss enamel. The unit is designed for operation under severe enviornmental conditions. The overall demensions of the unit are; 34" long, 14" wide, and 13-5/8" high. The unit weighs approximately 70 pounds. Handles are included for portability.

An external source of 115 volt, 400 cycle power is required for the operation of the Model 8454, to run the cooling blower. Furnished with the unit is a 15 foot detachable power cable for connection to the 400 cycle line. The cable is terminated at one end with a AN3106E 16-10S socket to mate with the AN3120E 16-10P plug mounted on the Terminal Box of the Load. The other end of the cable terminates with an Amphenol 7-8649 plug for connection with a 400 cycle ac outlet.

SECTION II - THEORY OF OPERATION

The Model 8454 Dummy Load consists of 12 non-inductive, wire wound 600 ohm resistors, connected in parallel. The resulting parallel resistance is therefore a nominal 50 ohms, with the reactive component being extremely small.

Cooling air is forced around the resistors by an axial blower, increasing the total power dissipation capacity of the Load to well over 4500 watts. The voltage rating of the unit, which is dependent of the individual resistors, is well in excess of 12,000 volts.

Monitoring of the input signal to the Load is achieved by an output jack which is capacitively-coupled to the input. The connector mount contains a voltage divider which may be adjusted by sliding the mount in or out of the housing.

W A R N I N G

Due to the nature of the pulse power dissipated in the Load, dangerously high voltages are present when the equipment is being operated. The Dummy Load is grounded through the power cable to the ground point of the 400 cycle distribution system. Be sure this ground is secure before attempting and operations with the Model 8454 Dummy Load.

SECTION III - INSPECTION AND INSTALLATION

1. Inspection:

The Model 8454 Dummy Load is packed complete and ready for use. However, before placing into service, a preliminary inspection and test should be made in case damage occurs during shipping.

a. Check the dc resistance of the load. The resistance between the center connector and shell (ground) of the input connector (UG-37A/U) should read between 47.5 and 52.5 ohms. Any deviation from this would indicate possible damage to one or more of the resistors. This condition would cause an impedance mismatch to the transmitter and could inflict damage to the transmitter.

b. Check the operation of the blower. Connect the ac power cord to a source of 115 volts, 400 cycles, and turn the power switch "ON". The blower should attain a proper speed, and a blast of air felt coming out the front end of the unit.

W A R N I N G

Do not apply pulse power to the load at any time without proper blower operation.

2. Installation:

Since the Model 8454 is forced-air cooled, it normally should be operated in a horizontal position only, with a clear air passage at both the front and rear ends of the unit. Although the Dummy Load has a wide operating temperature range, the power ratings of the resistors will be increased and their life therefore extended by keeping the air inlet temperature as low as possible.

Before operating the Model 8454 Dummy Load, connect the power cord to a source of 115 volts, 400 cycle ac. Never operate the Dummy Load without the blower running.

Connect the pulse output cable from the radar equipment to the large UG-37A/U input connector.

Connect the monitoring equipment to the smaller BNC Type connector. The unit is now ready to operate.

SECTION IV - OPERATION

1. Before applying the pulsed power to the unit, turn on the blower in the Dummy Load. The pilot lamp above the switch on the terminal box will light. If the fuse should fail, a neon bulb in the cap of the fuse holder will glow, indicating that the fuse is blown. Replace the bad fuse with one of the spares stored in the holders beneath the active fuses.

2. Apply the pulsed power from the radar equipment. After a few minutes, the exhaust air will become warm, indicating the presence of pulse power being applied.

3. The radar signal may be monitored as desired from the output jack. The amplitude of the output signal being monitored can be adjusted by loosening the set screws and sliding the connector in or out of the housing. Make sure the set screws are retightened after adjustment.

4. After pulse power has been removed, allow the blower to run for at least five minutes. This will insure that the unit has been cooled sufficiently to prevent possible temperature rise from the latent heat built up in the resistors.

SECTION V - MAINTENANCE

Very little maintenance is required on the Model 8454 Dummy Load. Under normal usage, the periodical cleaning of the air filter and keeping the unit wiped off will suffice. The unit should be stored away from dusty places. If this cannot be accomplished, keep the unit covered when not in use. The pulse input connector can be kept clean by using a little dry solvent. Inhibisol, or its equivalent is recommended. Trichlorethylene on a cotton swab stick may also be used. When using solvents, provide adequate ventilation and observe normal care.

The motor is sealed and requires no lubrication. Since the resistors are conservatively rated, they should not be a likely source of trouble.

If replacement of any parts is required, the following steps should be followed in disassembling the unit:

1. Air Filter

To remove the air filter for periodic cleaning, remove the four screws holding the end cover ring. The air filter then slips out of the load housing as a unit and can be cleaned as such. Do not allow the air filter to become excessively dirty. This condition will dangerously impair the cooling air flow.

2. Load Resistor Assembly

To remove the load resistor assembly, first remove the front handle by unscrewing the two 10-32 x 1 inch flat head machine screws with a screw-driver. Second, remove the front end ring, held by two 8-32 screws. Next, remove the three long spoke bolts mounted approximately 8 inches from the rear cover. These bolts extend through the housing and the deflector assembly, and fasten

to the rear of the load section assembly. (In re-assembling, the holes must line up precisely). Fourth, remove the four 10-32 screws (two on each side) mounted through the housing tube pads just above the front shock mounts. This enables the entire load section assembly to be moved forward and out of the load housing.

If resistors are suspected of being faulty, they can be removed from their holders and each checked seperately. Each resistor should have a value of 600, ±30 ohms. The total parallel resistance of the entire assembly should be 50, ±2.5 ohms. When replacing the resistors, be sure they seat firmly in their clips and fasten with straps provided.

3. Blower and Deflector Assembly:

For removal of blower and deflector assembly, first remove the rear handle by unscrewing the two 10-32 x 1 inch flat head machine screws with a screwdriver. Second, disconnect the power cable from the blower terminating the junction box by unsoldering the three leads, unscrewing the ground strap, and unclamp the cable so that it is free to slide out through its channel. (The white lead is connected to the pilot lamp on the capacitor side, the black lead is connected to the other side of the capacitor, and the red lead is connected to the 51K resistor. Refer to Figure 1). Third, remove the three long spoke bolts (mounted approximately 8 inches from the rear cover). As noted in Part 2 of this section, the holes for the spoke bolts must be exactly lined up when re-assembling the blower and deflector assembly. Fourth, remove the four (two on each side) 10-32 x 1/2 inch round head machine screws which hold the deflector assembly. Two screws are mounted in a radial plane with the spoke bolts, the other two are approx-

imately four inches farther forward. This will allow the assembly to be pulled out the rear, with the blower cable slipping out of the terminal box through its channel.

When replacing the blower section, it may be necessary to remove the load resistor section in order to feed the power cable back through its channel. By inserting a special wire lead through the blower cable channel, it will be easier to pull the cable back into the terminal box.

To replace either the blower or load sections, reverse the procedure given in the above paragraphs.

If the blower fails to run and is not stuck or frozen, check the fuses first, the 1.0 mFd. capacitor mounted in the terminal box, and continuity of power cable and blower motor windings before disassembling the unit.

4. Replacement of Shock Mounts

If shock mounts require replacement, first remove the 3/8-16 x 1/4 inch bolt found on each shock mount bracket (4 total), and remove the ground strap located on the right front bracket on the unit housing side. Second, lift the unit out the cradle. Third, remove the four 10-32 x 1/2 inch round head machine screws on each shock mount to completely remove the shock mounts.

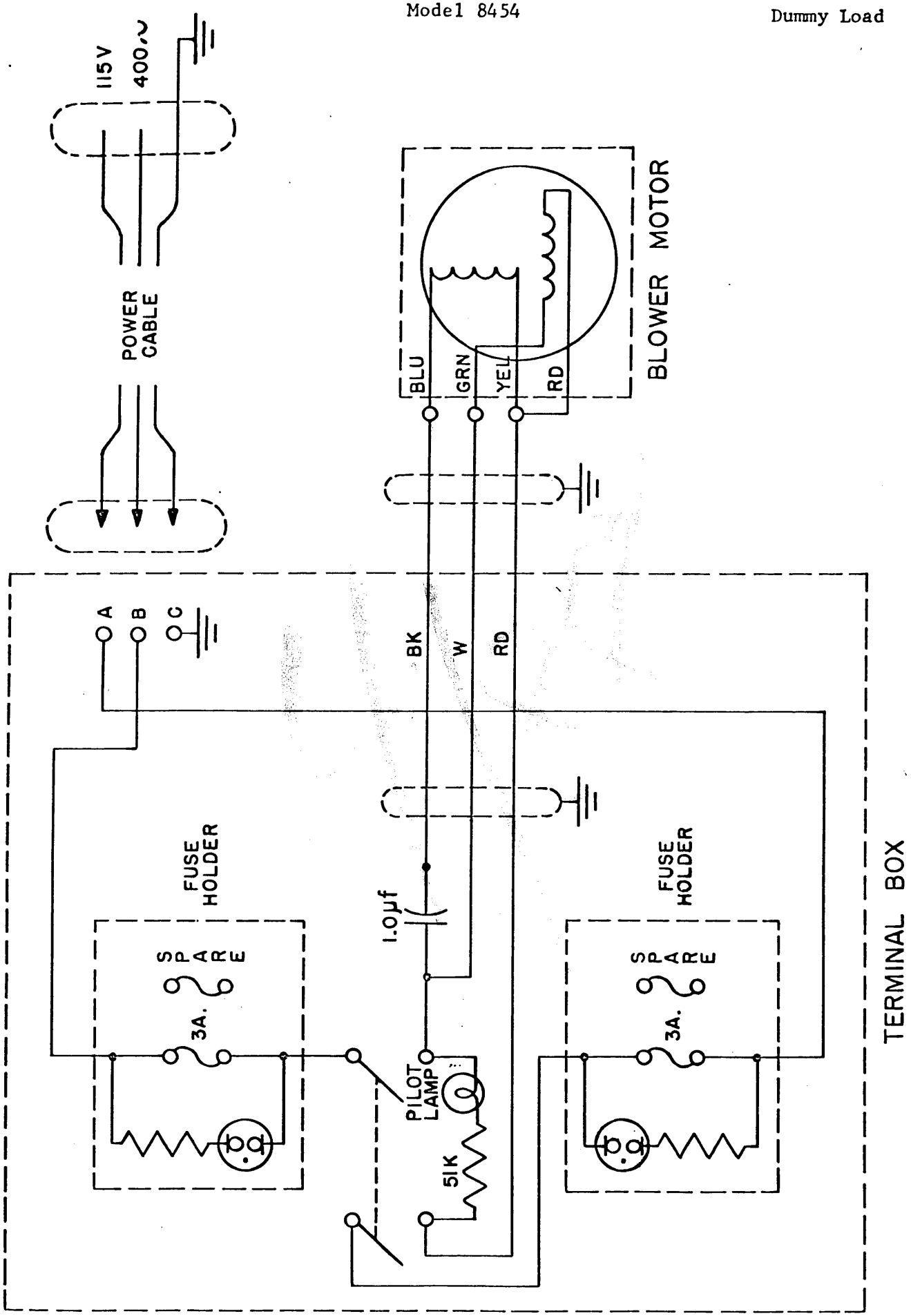


Fig. 1 Terminal Box and Blower Schematic

SECTION VI

Table of Replaceable Parts

Blower and Deflector Unit

Item	Req.	Drawing No.	Description
1	1	845322	Assy, Deflector
2	1	5211	Fan Unit (Modified)
3	3	5220	Terminal Post
4	1	845324	Nut, Strip
5	1	845323	Assy, Motor Cable
6	1	5226	Clamp, Cable
7	2	81774	Grommet
8	1	845319	Assy, Blower Back Ring
9	1	84532	Screen, Filter Guard
10	1	84533	Screen, Air Filter
11	1	845334	Ring, End Cover

Load Section

Item	Req.	Drawing No.	Description
12	12	817121	Resistor, 600 Ohm
13	24	84514	Clip, Load Resistor
14	24	84515	Strap, Resistor
15	10	84552	Insulator, Stand-Off
16	20	81749	Washer, Fiber
17	4	84548	Spacer, Linkage Plate
18	1	81753	Connector, Pulse
19	1	81741	Assy, Dust Cap
20	1	845329	Assy, Monitor
21	1	5182	BNC Dust Cap & Chain
22	1	84580	End Ring (Front)

Table of Replaceable Parts (con't)

Terminal Box

Item	Req.	Drawing No.	Description
23	1	5208	Connector, Power
24	1	845310	Gasket, Connector
25	1	81758	Switch
26	2	5210	Holder, Fuse
27	4	Std.	Fuse, 3AB-3A
28	1	5003-14	Assy, Light
29	1	81759	Lamp, Neon (NE-51)
30	1	81755	Resistor, 51K Ohm
31	1	5224	Capacitor, 1.0 mfd.
32	1	845311	Bracket, Capacitor
33	1	81774	Grommet
34	1	84578	Gasket, Terminal Box
35	1	845312	Cover, Terminal Box
36	1	845331	Assy, Power Cable

Base & Housing Section				Remarks
37	4	84558	Bracket, Base	
38	4	83047	Shock Mount	
39	1	83041	Ground Strap	
40	4	845405	Foot, Bumper	
41	2	845404	Handle	
42	3	84581	Bolt, Receptacle Spoke 3-1/2 x 1/4-20	

Fig. 2 Assembly Illustration

Item *	Description
A	Screws, Mounting, Resistor Assy.
B	Screws, Mounting, Deflector Assy.
1	Assy, Deflector
2	Fan Unit
5	Assy, Meter Cable
8, 9, 10	Air Filter Assy.
11	Ring, End Cover
12	Resistor, 600 ohm
13	Clip, Load Resistor
14	Strap, Resistor
18	Connector, Pulse
20	Assy, Monitor
22	End Ring (Front)
23	Connector, Power
26	Holder, Fuse
35	Cover, Terminal Box
36	Assy, Power Cable
38	Shock Mount
42	Bolt Receptacle Spoke - 3-1/2 x 1/4-20

* Refer to Item No. in Table of Replaceable Parts. (Section VI).

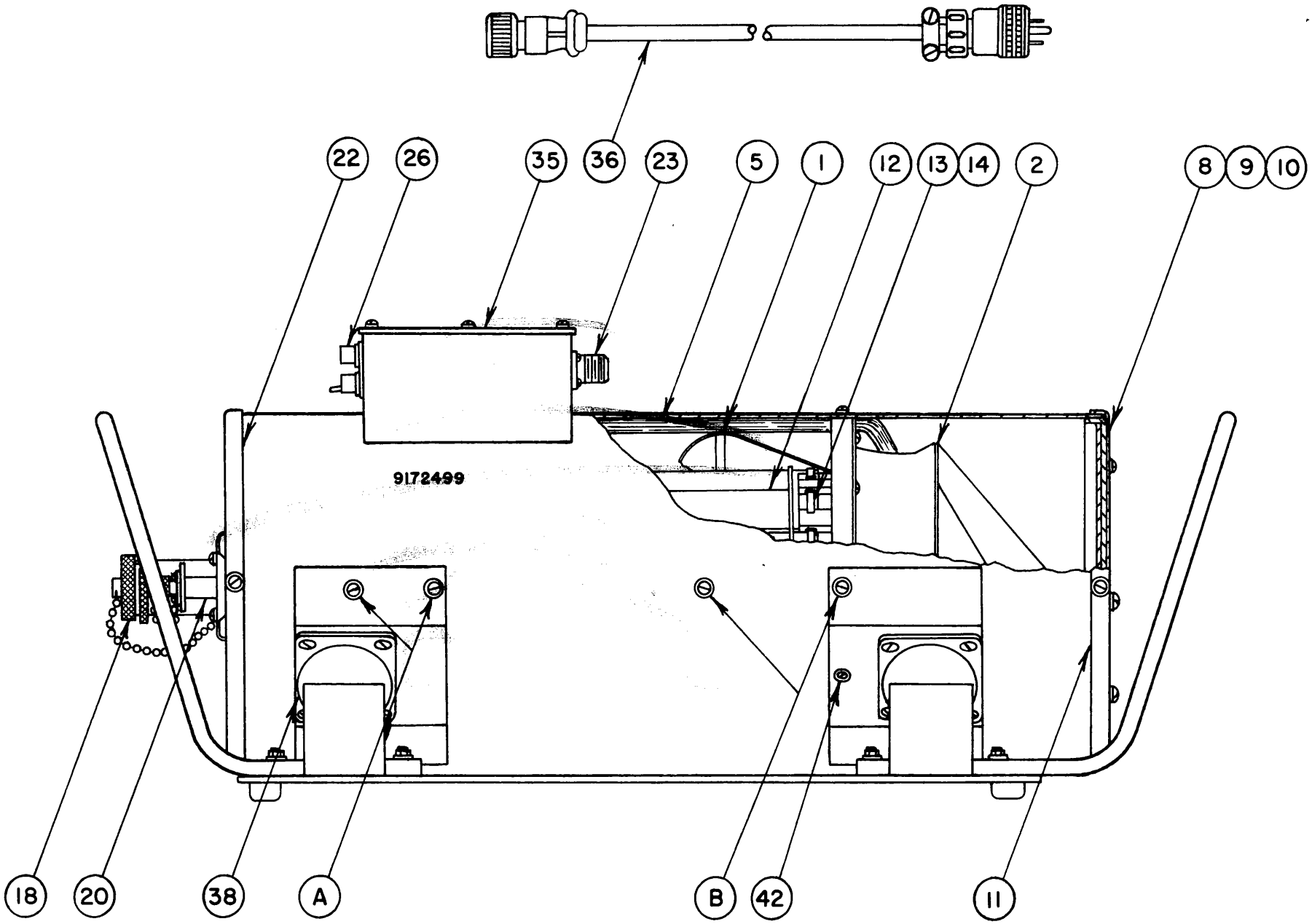


Figure 2. Assembly Illustration - Model 8454