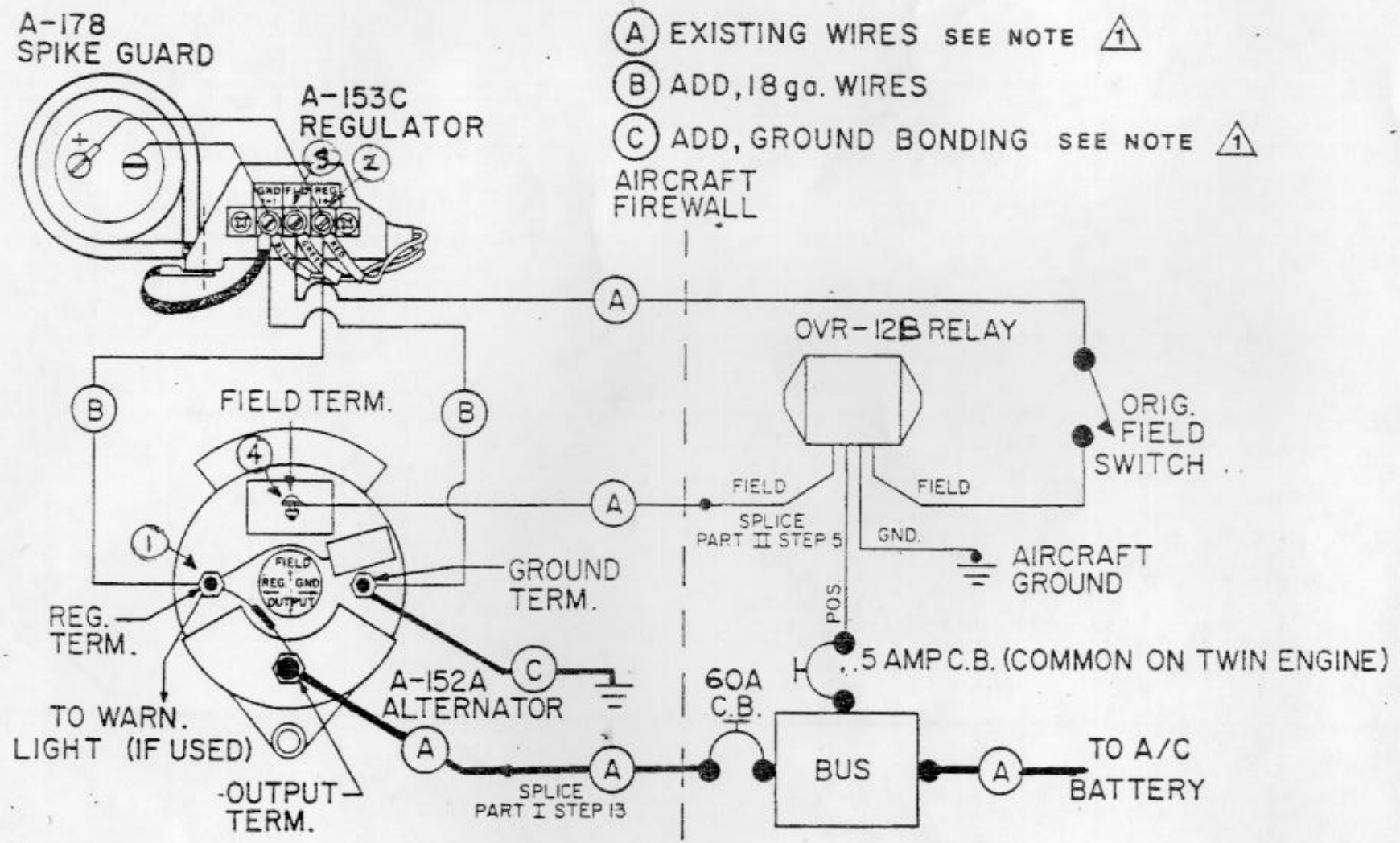
INTERAV INC.
106 EAST RHAPSODY DR.
SAN ANTONIO, TEXAS 78216

210 ~~512~~ 344-2785



1 AC-43.13-1A CHAPTER 11 SECTIONS 2 AND 3 SHOULD BE CONSULTED FOR MINIMUM WIRE SIZES FOR 50 AMP OUTPUT.

TYPICAL WIRING DIAGRAM
ALTERNATOR SYSTEM, SINGLE AND TWIN ENGINE INSTALLATION

TROUBLE SHOOTING GUIDE

1. Engine NOT running
2. Master switch "ON"
3. Field switch "ON"
4. Confirm that Alt. output term has 12.5 volts
5. Take voltage readings (1) thru (4) to diagnose fault

CONDITION OR FAULT	VOLTAGE MEASUREMENT TO GROUND			
	(1) ALTERNATOR	REGULATOR		(4) ALTERNATOR
	REG. Term.	(2) REG. Term.	(3) FIELD Term.	FIELD Term.
NORMAL	1.0 ± 0.2	1.0 ± 0.2	1.0 ± 0.4	1.0 ± 0.4
FLD. CIRC. OPEN: 1. BROKEN WIRE; 2. OPEN FLD. SWITCH; 3. OPEN OVR	7.5	7.5	7.5	0
FLD. CIRC. OPEN: 4. OPEN BRUSH; 5. FAULT ROTOR				7.5
FAULTY REGULATOR: REG. OPEN	9.0/11.5	9.0/11.5	0	0
FAULTY REGULATOR: REG. SHORTED	0.8	0.8	0.6	0.6
REG. WIRE OPEN (Broken wire or bad connection)	12.5	0	0	0
RESISTOR OPEN	0.4	0.4	0	0

Report 65-113

Belt - Beech P/N 53954

INSTALLATION INSTRUCTIONS

INTERAV ALTERNATOR

MODEL NO. 1255A

STC SA 334 SW

INTERAV INC.
P.O. BOX 16714 • 512-344-2785
100 E. NAKOMA DR. • SAN ANTONIO, TX. 78216

"Alan"

TABLE OF CONTENTS

AIRCRAFT INDEX

Aircraft Approved – STC SA334SW – September 15, 1975

Aircraft Designation

SINGLE ENGINE Refer to SECTION I for Installation Instructions

Beech 23, all series
*Beech 35, all series with Continental O-470/IO-470 engines
*Beech H35, J35, K35, M35, N35, P35, 35-33, 35-A33, 35-B33, 35-C33
Bellanca 14-19, all series with Continental O-470/IO470 engines
Cessna 180, all series
Cessna 182, all series
Cessna 185, all series
Cessna 206
Cessna 210, all series
Cessna 210-5, all series
Consolidated Aeronautucs Colonial C1, C2, Lake LA-4, all series
*Downer (Republic) RC-3
Helio H250, all series with belt-driven generators
**Hughes 269, all series with belt-driven generators
Intermountain (Callair) A, all series with belt-driven generators
Lockheed 402-2
Meyers 200, all series
Mooney M20, all series except those with IO-360 wide deck engines
Navion D, E, F, G, and others with O-470 and IO-470 engines
Piper PA-12, PA-12S,
Piper PA-16
Piper PA-18, all series with belt-driven generators
Piper PA-20, all series with belt-driven generators
Piper PA-22, all series with belt-driven generators
Piper PA-24, PA-24-250 engines
Piper PA-25, all series
Piper PA-28, all series

TWIN ENGINE Refer to SECTION II for Installation Instructions

Camair 480
Helio 500
Pine Air (and) Fleet Aircraft Ltd. Super-V
Piper PA-23, all series
Piper PA-30

*See SECTION V For Supplemental Information
**See Section IV Optional Equipment and Spares List

United States of America
Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA334SW

This certificate, issued to InterAv, Inc.
P. O. Box 16714
100 E. Hakoha
San Antonio, Texas 78216

certifies that the change in the type design for the following product with the limitations and conditions thereto as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air Regulations.

Original Product — Type Certificate Number See Limitations and Conditions
Make See Limitations and Conditions
Model See Limitations and Conditions

Description of Type Design Change Installation of InterAv Alternator in accordance with Report 65-113, Revision G dated 5/11/81, or later FAA or FAA DER approved revisions.

Limitations and Conditions
See attached Eligibility List dated July 20, 1981, FAA approved, for original type certificate numbers, makes, and models.

Compatibility of this modification with other previously approved modifications must be determined by the installer.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application January 8, 1964
Date of issuance February 3, 1964
Date amended 7/27/64; 10/8/64; 12/8/64; 3/26/65; 9/16/65; 11/26/65; 1/14/66; 3/18/66; 5/3/66; 10/21/66; 9/15/75; 8/6/76; 11/22/77; 5/17/79, 5/4/81; 7/20/81 Revision 16

By direction of the Administrator

(Signature)

John P. Watson
Chief, Engineering and Manufacturing Branch
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

HINTS ON OPERATING YOUR ELECTRICAL SYSTEM

Alternators have different characteristics than DC Generators. Although the Alternator has several "built-in" safety features to protect its system, no mechanical devices can substitute for Good Operating Practices. To insure that your Alternator system will always render you dependable service, thoroughly familiarize yourself with the warnings listed below and see that these warnings are complied with. Failure to comply could result in damage to your electrical system.

DON'T open battery switch at any time that Alternator is operating!

DON'T operate Alternator with battery disconnected at any time.

DON'T turn battery switch "ON" when battery is being charged with battery charger.

DON'T use outside power source to start aircraft unless absolutely certain that polarity is correct. That is, positive to positive and negative to negative.

DON'T open Alternator circuit breaker at any time when Alternator is operating if manual-type circuit breaker is used. Leave in "ON" or closed position at all times.

DON'T install battery cables in reverse polarity. Connect positive lead to positive post and negative lead to negative post.

DON'T operate Alternator at any time with Alternator "OUTPUT" lead disconnected.

DON'T ground field terminal at any time Alternator is operating.

NOTE: To make Alternator inoperative when checking for radio noise, only the field circuit should be opened. On aircraft that do not have an individual switch for the Alternator field circuit (gen. switch), it will be necessary to disconnect the field lead at the Alternator and then run engine. (See SECTION III)

Section I

ALTERNATOR INSTALLATION
BASIC INSTALLATION KIT #SE

Single Engine Aircraft

PARTS LIST

Quantity	Part Number	Ref. No.	Description
1 each	015-01237	A-152A	Alternator Assembly
1 each	625-61609	A-153 D	Voltage Regulator
1 each	635-62448	OVR-12B	Overvoltage Relay
1 each	015-01240	A-167D	Mounting Kit
1 each	245-23709	A-178	Spike Guard Capacitor
2 each	165-15041	A-178-2	Clamps
1 each	435-42408	A-178-4	Lead Kit
1 each	395-37992	A-178C	Hardware Kit
1 each	415-40054	OVR-12A-6	Placard
1 each		AR65-113	Installation Instructions

See Section IV Optional Equipment and Spares List

ALTERNATOR INSTALLATION

Instructions for Installation

Single Engine Aircraft

PART I: INSTALLATION OF ALTERNATOR AND REGULATOR

1. Disconnect battery, identify, mark, and disconnect original wires from Generator and Regulator.
2. Remove Generator and Voltage Regulator.
3. Install Alternator, Part Number 015-01237, using existing generator mounting brackets. Install mounting bar with hardware supplied in kit, Part Number 015-01240. Use AN970-5 washers to adjust spacing between generator bracket and bar bracket. If front hole in bar is utilized, install short AN5H5A with two washers to prevent interference with AN8H15A bolt.
4. Adjust for proper pulley alignment and install approved drive belt and adjust belt tension in accordance with standard procedures. Safety wire bolts together as required and safety AN8H15A bolt around support bar.
5. Install Voltage Regulator, Part Number 625-61609, where original regulator was mounted. Check that the free end of the bonding strap is well grounded to the airframe. Using hardware, clamps and leads, mount spike guard capacitor, Part Number 245-23709, to regulator as shown on diagram.
6. If original circuit breaker is rated less than 60 amp, remove and replace with Part Number 295-29694, 60 amp circuit breaker. Reconnect wires.
7. Connect the large wire removed from the generator output terminal, to the output terminal of the alternator, AC-43.13-1A, Chapter 11 covers in detail, wire size requirements to accommodate the 50 amp alternator output.
8. Connect the small wire removed from the generator field terminal to the field terminal of the alternator.
9. Install a bonding strap or a wire, as large, or larger than, the original generator output wire, from the ground terminal of the alternator to the engine mount or engine case. Be sure you have a good ground between the alternator and the airframe.
10. Install an 18 ga. wire from the ground terminal of the alternator to the ground terminal of the voltage regulator.
11. Install an 18 ga. wire from the alternator reg. or (aux) terminal to the reg. terminal of the voltage regulator.
12. Connect the original field wire from the cabin generator field switch to the field terminal of the voltage regulator. Note that this wire was originally attached to the field terminal of the old regulator.
13. Splice the remaining two heavy wires which were connected to bat. and gen/armature terminals of the original voltage regulator together using butt or ring type amp terminals of proper size.

PART II: INSTALLATION OF OVERVOLTAGE RELAY

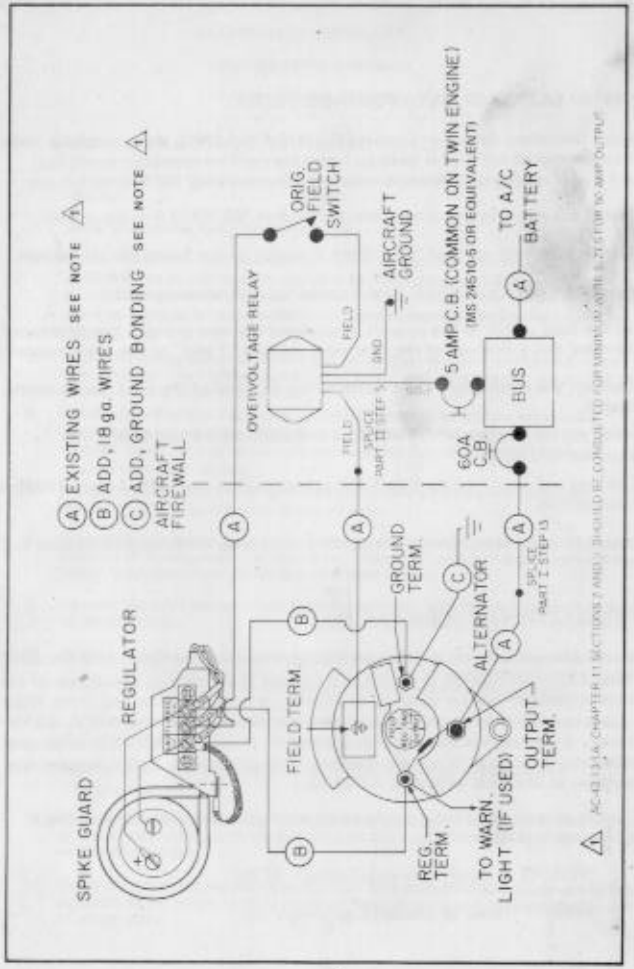
1. Install Overvoltage Relay, Part Number 635-62446 or 635-62448, in an area behind instrument panel which will provide clearance from other electrical component connections and clear of moving parts. Mount to convenient structure using No. 8 screws and nuts.
2. Install a 5 amp trip free circuit breaker such as MS24510-5 or equivalent.
3. Connect the wire marked "Pos" from the relay to the 5 amp circuit breaker.
4. Connect the wire marked "Gnd" from the relay to a good airframe ground.
5. At the field switch in the aircraft, disconnect the wire going to the Alternator field terminal and splice one of the two wires marked "Field" to the disconnected wire.
6. Connect the remaining "Field" wire to the terminal of the field switch vacated in Step 5.
7. Install placard, Part Number 415-40054, on instrument panel in view of pilot near alternator field switch.
8. Use ring and butt type terminals and splices such as amp 32951 and 321026 for all connections.
9. Insure all wires are properly secured and work is done in compliance with A.C.43.13-1A

PART III: PREPARATION OF FORM FAA 337

1. Install Alternator in accordance with Supplemental Type Certificate No. SA334SW. Weight Change: (Compute weight and balance as necessary). Check size of wire from Alternator output terminal to Alternator circuit breaker and from Alternator circuit breaker to buss and size of Alternator circuit breaker with A.C. 43.13-1A. (Note: Continue this statement as applicable. If wire and circuit breaker sizes are satisfactory, so state. If not satisfactory, state wire and/or circuit breaker size installed to conform with A.C. 43.13-1A.)
2. Modify aircraft equipment list by removal of generator listed and adding alternator installation.

   WEIGHT: Alternator installation – 11 lbs

   ARM: Refer to Aircraft Equipment List



TYPICAL WIRING DIAGRAM
ALTERNATOR SYSTEM, SINGLE AND TWIN ENGINE INSTALLATION

Section II

ALTERNATOR INSTALLATION
BASIC INSTALLATION KIT #TE

Twin Engine Aircraft

PARTS LIST

Quantity	Part Number	Reference No.	Description
2 each	015-01237	A-152A	Alternator Assembly
2 each	625-61609	A-153D	Voltage Regulator
2 each	635-62448	OVR-12B	Overvoltage Relay
2 each	015-01240	A-167D	Mounting Kit
2 each	245-23709	A-178	Spike Guard Capacitor
4 each	165-15041	A-178-2	Clamps
2 each	435-42408	A-178-4	Lead Kit
2 each	395-37992	A-178C	Hardware Kit
1 each	415-40055	OVR-12A-7	Placard
1 each		AR65-113	Installation Instructions

See SECTION IV for Optional Equipment

ALTERNATOR INSTALLATION

Instructions for Installation

Twin Engine Aircraft

PART I: INSTALLATION OF ALTERNATOR AND REGULATOR

1. Install Alternators and Regulators on each engine in accordance with instructions for Single Engine.
2. Remove paralleling relays and secure wires. The Alternator system does not require paralleling relays.

PART II: INSTALLATION OF OVERVOLTAGE RELAY

1. Install overvoltage relays for each engine in accordance with instructions for single engine.
2. Install placard, Part Number 415-40055, on instrument panel in view of pilot near alternator field switch.

PART III: PREPARATION OF FORM FAA337

Install Alternator in accordance with Supplemental Type Certificate No. SA334SW. Weight Change: (Compute weight and balance as necessary.) Check size of wire from right and left Alternator output terminals to right and left Alternator circuit breakers and from right and left Alternator circuit breakers to buss and size of right and left Alternator circuit breakers with A.C. 43.13-1A. (NOTE: Continue this statement as applicable. If wire and circuit breaker sizes are satisfactory, so state. If not satisfactory, state wire and/or circuit breaker size installed to conform with A.C. 43.13-1A.)

WEIGHT: Dual Alternator Installation weight – 22 lbs

ARM: Refer to Aircraft Equipment List

SECTION III

RADIO NOISE SUPPRESSION TECHNIQUES

The Alternator system has built-in radio noise suppression, and virtually eliminates all noise and interference, on most installations. If additional suppression is required, a qualified Radio Maintenance Technician should be consulted for recommendations.

SECTION IV

OPTIONAL EQUIPMENT AND SPARES LIST

OPTIONAL EQUIPMENT

Req. Per Engine	Part Number	Reference No.	Description
1	295-29694	A-154	Circuit Breaker, 60 amp (KLIXONCLM60)
1	295-29699	A-200	Circuit Breaker, 5 amp (MS24510-5 or equivalent)
1	465-45923	A-168	Ammeter, 60 amp (SW359M)
1	015-01246	A-152-3	* Fan, Cooling, for opposite rotation engine
1	015-01245	A-179-1	Arm, Belt Adjust, PA-22

*Reference Fan/Alternator rotation from rear of Alternator. (Fan should pump air from inside Alternator.)

Spares List

Req. Per Engine/Aircraft	Part Number	Reference No. (Old P/N)	Description
1	015-01237	A-152A	ALTERNATOR ASSEMBLY
1	245-23693	A-177-1	Capacitor
1	655-64139	A-152A-1	Resistor
1	115-09964	A-152-2	Brush Assembly
1	015-01247	A-152-4	* FAN, COOLING, STANDARD ROTATION
1	015-01246	A-152-3	* FAN, COOLING, for opposite rotation engine
1	015-01240	A-167D	MOUNT BAR ASSEMBLY W/HARDWARE
1	015-01245	A-179-1	Arm, Belt Adjust, PA-22
1	625-61609	A-153 D	VOLTAGE REGULATOR ASSEMBLY
1	625-61610	A-153-3	Strap, Grounding
1	245-23810	A-178A	SPIKE GUARD ASSEMBLY
1	245-23709	A-178	Capacitor
2	165-15041	A-178-2	Clamp
1	435-42371	A-178-1	Lead Assembly 3.5"
1	435-42372	A-178-3	Lead Assembly 5.5"
1	395-37992	A-178C	Hardware Kit
1	635-62448	OVR-12B	OVERVOLTAGE RELAY
1	415-40054	OVR-12A-6	Placard, Single Engine
1	415-40055	OVR-12A-7	Placard, Twin Engine

*REFERENCE FAN/ALTERNATOR ROTATION FROM FROM REAR OF ALTERNATOR. FAN SHOULD PUMP AIR FROM INSIDE ALTERNATOR

REMANUFACTURED EXCHANGE

PART NO.	REF. NO.	DESCRIPTION
015-01248	A-152-A	ALTERNATOR ASSEMBLY

SUPPLEMENTAL INFORMATION

1. Compliance with the following excerpt from (BEECHCRAFT SERVICE NEWS), Vol. XIII, No. 2, Feb. 1960 is recommended when an INTER AV Alternator kit is retrofitted to Bonanza Aircraft.

> *"SHOCK MOUNTED GENERATOR BRACKETS – A new shock mounted generator bracket which will reduce vibration, the major cause of premature generator and generator bracket failures, has been developed for the Continental O–470 and IO–470 series engines. The shock mounted generator bracket is available for installation on the Bonanza series of airplanes, serials D–4866 through D–6161. Installation of this new bracket will be made at the factory on all Model 33 aircraft and on Bonanzas, serials D–6162 and after. This improved bracket assembly was developed by Continental Motors and is available in Continental kit EQ–5841. The kit consists of four rubber shock mounts, a new generator brace, a new mounting bracket, attach– parts, and installation instructions. Further information concerning Kit EQ–5841 or the kit itself may be obtained by contacting the Continental Motors Corporation of Muskegon, Michigan or any authorized Continental Distributor."*

NOTE: It is our understanding that the kit mentioned in the above exerpt is no longer available as a kit, but individual parts are currently available from Teledyne Continental Motors through their customer service department in Mobile, Alabama.
(See Generator and Brackets, Models IO-470 C through S in Continental Motors Book.)

2. Installation of Alternators on aircraft equipped with Counter-Rotating Engines:

An opposite rotation fan, Part Number 015-01246, is available from the factory on an exchange basis at no charge. Remove the Part Number 015-01247 fan from the Alternator to be installed on the opposite rotation engine and replace with Part Number 015-01246 fan.

3. Piper PA–24–250 Belt Recommendations – Gates Belt P/N's 575TG (31"), 8353 (31–1/8") or 8242 (32–1/8").

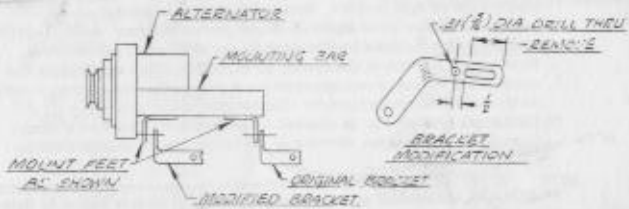
4. STC SA334SW is approved for installation on those aircraft listed on Page 2 using the "narrow deck" Lycoming engines. Later versions of some aircraft will have the "wide deck" Lycoming engine installed. Check with your local GADO for assistance with field approval to install this alternator system on wide deck Lycoming engines.

INTERAV INC. ALTERNATOR INSTALLATION
Downer (Republic) RC-3 -- SEABEE -- Franklin 6A8-215

5. This is an illustration of one method of mounting the Alternator. Other methods may be employed at the discretion of the installing agency, provided that installation conforms with instructions outlined in Report 65-111 (single engine).

1. In order to properly align the alternator belt it will be necessary to modify the existing front generator steel mounting bracket by drilling one 5/16" hole 1/2" ahead of the slot. Cut the slotted end off and reinstall the bracket on the engine, using the same cap screw.

2. Assemble the alternator feet on the alternator mounting bar and install the feet on the front side of the original generator brackets, using the original bolts, as shown on the sketch.



3. The generator belt tension adjustment bar is turned upward and attached to the threaded hole in the alternator, nearest the engine case. It may be necessary to add washers to the lower end of the bar in order to align the bar with the alternator. In the event your belt adjustment bar is the long type, drill new hole in bar as per sketch and cut off excess material. Use Franklin P/N 14883 or Goodyear 5L380 Belt.