

PRODUCTION CHANGE SHEET  
FOR  
PORTABLE RECEIVERS  
MODEL 4ER28A1 & 11; REV. J  
MODEL 4ER28A2 & 12; REV. P  
MODEL 4ER28B1 & 11; REV. P  
MODEL 4ER28B2 & 12; REV. R

Changes listed below are identified by the letter appearing in the REV. Pad.

REV. A (Models 4ER28B1,2,11,12 only) - resistors changed to improve performance. Transistors changed to agree with changes in vendor designations.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
Q303 thru Q305	Transistor, G-E Type 2N450.	Transistor, G-E Type 2N450 or 4JX1A810.
Q310	Transistor, G-E Type ZJ22.	Transistor, G-E Type 3N37.
G303,4-R1 and G303,4-R5	Resistor: composition, 6200 ohms $\pm 5\%$ , 1/10 w. G-E Part No. C-3R151-P622J.	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.
G303,4-R3 and G303,4-R7	Resistor: composition, 4700 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R152-P472K.	Resistor; composition, 2200 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R152-P222K.
G303,4-R4 G303,4-R8	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.	Resistor: composition, 2200 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P222K.
G303,4-Q1	Transistor, G-E Type 4JX3B502.	Transistor, G-E Type 4JX3B512.
Z304-Q1	Transistor, G-E Type 4JD3B5.	Transistor, G-E Type 4JD3B5 or 4JX3B505.
Z304-Q2	Transistor, G-E Type 4JD2A32.	Transistor, G-E Type 4JD2A24.

Elementary Diagram Changes

Changed delineation of parts as follows:

Was:Changed To:

Q303, 2N450	Q303, 2N450/4JX1A810
Q304, 2N450	Q304, 2N450/4JX1A810
Q305, 2N450	Q305, 2N450/4JX1A810
Q310, ZJ22	Q310, 3N37
G303,4-R1, 6200, 1/10 w.	G303-R1, 3900, 1/10 w.
G303,4-R3, 4700, 1/4 w.	G303-R3, 2200, 1/4 w.
G303,4-R4, 3900, 1/10 w.	G303-R4, 2200, 1/10 w.
G303,4-R5, 6.2K	G303,4-R5, 3.9K
G303,4-R7, 4.7K	G303,4-R7, 2.2K
G303,4-R8, 3.9K	G303,4-R8, 2.2K
G303,4-Q1, 4JK3B502	G303-Q1, 2JX3B512
Z304-Q1, 4JD3B5	Z304-Q1, 4JD3B5/4JX3B505
Z304-Q2, 4JD2A32	Z304-Q2, 4JD2A24

REV. B (Models 4ER28B1,2,11,12 only) - resistors changed to improve sensitivity.

Part ChangedWasChanged To

Z303-R11	Resistor: composition,	Resistor: composition,
and	3300 ohms $\pm 10\%$ , 1/4	2200 ohms $\pm 10\%$ , 1/4
Z303-R16	w. G-E Part No.	w. G-E Part No.
	C-3R152-P332K.	C-3R152-P222K.

Elementary Diagram Changes

Changed delineation of parts as follows:

Z303-R11, 3.3K to Z303-R11, 2.2K  
 Z303-R16, 3.3K to Z303-R16, 2.2K

REV. C (Models 4ER28B1,2,11,12 only) - decreases collector current

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
G303-R1	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.	Resistor: composition, 2200 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R152-P222K.
G303-R3	Resistor: composition, 2200 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R151-P222K.	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.
G304-R1,R5	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.	Resistor: composition, 2200 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R151-P222K.
G304-R3,R7	Resistor: composition, 2200 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R151-P222K.	Resistor: composition, 3900 ohms $\pm 10\%$ , 1/10 w. G-E Part No. C-3R151-P392K.

#### Elementary Diagram Changes

Changed delineation of parts as follows:

G303-R1, 3.9K to G303-R1, 2.2K  
 G303-R3, 2.2K to G303-R3, 3.9K  
 G304-R1, 3.9K to G304-R1, 2.2K  
 G304-R3, 2.2K to G304-R3, 3.9K  
 G304-R5, 3.9K to G304-R5, 2.2K  
 G304-R7, 2.2K to G304-R7, 3.9K

REV. D (Models 4ER28B1,2,11,12 only) - improve first and second image ratio. Increase audio high frequency response. Reduce standby current drain.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
RT301	Thermistor: 10 ohms $\pm 10\%$ , max input watts 1.0 at 40°C, temp coefficient 1400 $\pm 10\%$ . Similar to Globar Type 781F. G-E Dwg. No. B-5490828-P1.	Thermistor: 30 ohms      B-5490828-P2.
R330	Resistor: composition, 750 ohms $\pm 5\%$ , 1/2 w. G-E Part No. C-3R77-P751J.	Resistor: composition, 2700 ohms $\pm 10\%$ , 1/2 w. G-E Part No. C-3R77-P272K.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
C326	Capacitor: Mylar, dielectric; 0.22 mfd ±20%, 100 v d-c w. Similar to Goodall Electric Co. Type 663-UW. G-E Dwg. No. B-7491930-P110.	Deleted.

Addition Changes

Removed ground link from Z304 nearest "cold" end of C1. Added shield can to solder side of RF board under first mixer and multiplier.

Elementary Diagram Changes

Deleted C326, 0.22 MFD  
Changed delineation of parts as follows:

RT301, 10 to RT301, 30.  
R330, 75 to R330, 2.7K

Outline Diagram Changes

Deleted C326 and deleted ground link from Z304.

REV. E (Models 4ER28B1,2,11,12 only) - improves limiter action and reduces audio distortion at high modulation levels.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
Z302-C8	Capacitor: ceramic Hi-K disk, insula- ted; 0.025 MFD +80% -20%, 50 v d-c w. Sprague Cat. #29C187. G-E Dwg. No. B-7491827-P3.	Capacitor: Mylar dielectric; 0.01 mfd ±20%, 50 v d-c w. Similar to Goodall Type 601PE. G-E Dwg. No. B-5491189-P105.
Z302-C9	Capacitor: ceramic	Capacitor: Mylar
Z303-C4	Hi-K disk, insulat-	dielectric: 0.022
Z303-C7	ed; 0.1 mfd ±80%	mfd ±20%, 100 v d-c
Z303-C10	-30%, 50 v d-c w.	w. Similar to
Z303-C13	Sprague Cat. #36C172.	Goodall Type 663-UW.
Z303-C14	G-E Dwg. No. B-7491827-P5.	G-E Dwg. No. B-7491930-P6.

Elementary Diagram Changes

Changed delineation of parts as follows:

Z302-C8, .025 MFD to Z302-C8, .068 MFD  
 Z302-C9, .1 MFD to Z302-C9, .022 MFD  
 Z303-C4, .1 MFD to Z303-C4, .022 MFD  
 Z303-C7, .1 MFD to Z303-C7, .022 MFD  
 Z303-C10, .1 MFD to Z303-C10, .022 MFD  
 Z303-C13, .1 MFD to Z303-C13, .022 MFD  
 Z303-C14, .1 MFD to Z303-C14, .022 MFD

REV. A (Models 4ER28A1,2,11,12 only)

REV. F (Models 4ER28B1,2,11,12 only)

Purpose of change - to improve audio response and distortion.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
R323	Resistor: composition, 5600 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R152-P562K.	Resistor: composition, 4700 ohms $\pm 10\%$ , 1/4 w. G-E Part No. C-3R152-P472K.

Elementary Diagram Changes

R323, 5.6K was changed to R323, 4.7K.

REV. B (Models 4ER28A1,11 only)

REV. G (Models 4ER28B1,11 only)

Purpose of change - to enable oscillation to tune over 144-150  
Mc frequency range.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
C361	Capacitor: ceramic disc; insulated, temp compensating; 15 mmfd $\pm 5\%$ , 500 v d-c w, -80 temp coef. G-E Dwg. No. C-7774846-P244.	Deleted
C374	Added	Capacitor: ceramic disc; insulated, temp compensating; 27 mmfd $\pm 5\%$ , 500 v d-c w, -80 temp coef. G-E Dwg. No. C-7774846-P249.

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REV. C (Models 4ER28A1,2,11,12 only)

REV. H (Models 4ER28B1,2,11,12 only)

Purpose of change - to facilitate the procurement of a maximum number of transistors.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
Q309	Transistor, G-E Type 3N37.	Transistor, G-E Type 3N37 or 4JX3C508.
Q310 and Q311	Transistor, G-E Type 3N37/4JX3C507/ 4JX3C509.	Transistor, G-E Type 3N37 or 4JX3C507.

Elementary Diagram Changes

Changed delineation of parts as follows:

<u>Was:</u>	<u>Changed To:</u>
Q309, 3N37	Q309, 3N37/4JX3C508
Q310, 3N37/4JX3C507/4JX3C509	Q310, 3N37/4JX3C507
Q311, 3N37/4JX3C507/4JX3C509	Q311, 3N37/4JX3C507

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REV. D (Models 4ER28A1,2,11,12 only)

REV. J (Models 4ER28B1,2,11,12 only)

Purpose of change - to optimize design in consideration of component variations.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
R323	Resistor: composition, 4700 ohms $\pm 10\%$ , 1/4 w. G-E Dwg. No. C-3R152-P472K.	Resistor: composition, 5100 ohms $\pm 10\%$ , 1/4 w. G-E Dwg. No. C-3R152-P512J.

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REV. E (Models 4ER28A1,2,11,12 only)

REV. K (Models 4ER28B1,2,11,12 only)

To stabilize discriminator idling for varying input signal levels.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
Z303-Q4 and Z303-Q5	Transistor, G-E Type 2N450/4JX1A552.	Transistor, G-E Type 2N188A.

Elementary Diagram Changes

Changed reference to Z303-Q4 and Z303-Q5 from 2N450/4JX1A552 to 2N188A.

REV. F (Models 4ER28A2,A12 only)

REV. L (Models 4ER28B2,B12 only)

Purpose of change - to insure tuning overlap at lower end of band.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
C360	Capacitor: ceramic disk, insulated, temp compensating 7 mmf $\pm 0.25$ mmfd, 500 VDCW -80 temp coef. G-E Dwg. No. C-7774846-P238.	Capacitor: ceramic disk insulated, temp compensating 9 mmf, $\pm 5\%$ , 500 VDCW -80 temp. coef. G-E Dwg. No. C-5496218-P239.

REV. F (Models 4ER28A1,11 only)

REV. G (Models 4ER28A2,12 only)

REV. L (Models 4ER28B1,11 only)

REV. M (Models 4ER28B2,12 only)

Purpose of change - To increase oscillator activity.

All models

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
G303/304 C8	Added	Capacitor: fixed ceramic disc, insulated, temp. compensating. Capacity 10 mmf., $\pm 10\%$ , 500 vdcw G-E Dwg. No. C-5496218-P10.

Models 4ER28A11,12, 4ER28B11,12 only -

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
G304 C9	Added	Capacitor: fixed ceramic disc, insulated, temp. compensating. Capacity 10 mmf., $\pm 10\%$ , 500 vdcw. G-E Dwg. No. C-5496218-P10.

Elementary Diagram Changes

Add C8 to G303 and G304 between emitter and base 2 of Q1. Add C9 to G304 between emitter and base of Q2.

REV. G (Models 4ER28A1,11 only)  
 REV. H (Models 4ER28A2,12 only)  
 REV. M (Models 4ER28B1,11 only)  
 REV. N (Models 4ER28B2,12 only)

Purpose of change - To increase receiver R.F. sensitivity.

<u>Part Changed</u>	<u>Was</u>	<u>Changed To</u>
Z304-C3 and Z304-C6	Capacitor: fixed, moulded, 0.47 pf $\pm 0.047$ pf, 500 vdcw, 0 temp coef. Jeffers Mfg. Co. Type JM-5/32. G-E Dwg. No. K-7130348-P1.	Capacitor: fixed, moulded, 0.62 pf $\pm 5\%$ , 500 vdcw 0 temp coef. Jeffers Mfg. Co. Type JM-5/32. G-E Dwg. No. K-7130348-P15.

Elementary Diagram Changes

Change values of Z304-C3 and Z304-C6.

REV. H (Models 4ER28A1,11 only)  
 REV. J (Models 4ER28A2,12 only)  
 REV. N (Models 4ER28B1,11 only)  
 REV. P (Models 4ER28B2,12 only)

Purpose of change - To assure the use of high quality transistor.

Change - New G.E. part numbers have been assigned to transistors Q303, Q304, Q305, Q306, Q307, Q308, Q309, Z303 -Q4 and Q5, and Z304 -Q1 and Q2.

REV. J (Models 4ER28A1,11 only)  
 REV. K (Models 4ER28A2,12 only)  
 REV. P (Models 4ER28B1,11 only)  
 REV. R (Models 4ER28B2,12 only)

Purpose of change - To improve operation of receivers at high humidity.

Change - The moisture resisting treatment of the coils in the 290 kc filter has been improved.

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