

murphy service information

29 FEB 1960

MURPHY MODEL P71 SERVICE INFORMATION

KEITH WALKER LTD.

TRAFALGAR STREET

Box 166, NELSON

CIRCUIT DESCRIPTION

The P71 is a seven PNP type transistor portable receiver of high performance and capable of reception under conditions of wide variations in field strength. It is capable of outputs up to 400 milliwatts. Battery life is determined by the amount of volume used and conditions of usage and under extreme conditions could vary from about 10 hours to 500 hours.

The circuit commences with a high gain aerial coil and ferrite rod, feeding a converter transistor of the alloy junction type. This is followed by two unilateralized alloy junction type transistors in a high gain I.F. amplifier. Amplified A.V.C. is obtained from TR4 and applied to TR2. Overload diode X1 operates when large signal conditions cause the A.V.C. control to alter the voltage at R25 sufficiently, giving excellent A.V.C. action. The I.F. signal is detected by forward biased diode X2, and the audio is fed directly to TR4, and is controlled at VR1 in the emitter lead. Audio is fed to the driver TR5 to the pushpull input transformer T6 and thence to the temperature compensated output pair TR6 and TR7 used in a Class B amplifier stage, through the output transformer T7, to the loud-speaker.

P71 SERVICE PROCEDURE

CHASSIS REMOVAL

The two wiring boards and metal panel are fastened to the baffle. The complete assembly is removeable from the cabinet by removal of wood screws. The two wiring boards are removeable individually. The R.F. and I.F. sections of the circuit are confined to the board on the left when viewed from the rear. The A.F. board is on the right-hand side, also viewed from the rear.

ADJUSTMENTS

A.V.C. :- If trouble is experienced with the receiver on local signals, check C12 and C14 for leakage. Preset control R14 should not be adjusted unless the voltage at the emitter of TR2 is other than approx. 1.62 volts, with a 6v. battery voltage. Should TR2 or TR4 be changed, or associated parts, adjustment of R14 may be necessary. Wrong adjustment will give poor sensitivity and A.V.C. control.

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Output transistor bias :- Provision is made for adjusting this for minimum crossover distortion, and should not require further adjustment. Should TR6 and TR7 be replaced (or R20 interfered with), adjustment of R20 may be necessary. The setting for minimum distortion varies at different levels of output. The recommended setting gives approx. .2v. at the bases of TR6 and TR7. It is recommended that the lead be intercepted between B- (on power switch) and the output transformer (centre of set). Insert a milliammeter and with no signal input adjust the standing current to approx. 3.7 ma. when the supply voltage is 5.6 v.

The other method is to adjust R20 when listening to a steady 400c/s tone of 50 milliwatts output (.36 volts across voice coil) for minimum distortion at approximately the half-way setting of R20. An oscilloscope may be used here. Check that the base voltage is about -.2 volts. A wrong setting here could overheat and damage the output transistors.

N.B. R14 is the upper of the two preset controls on the A.F. board. R20 is the lower. Slight variations in the values and circuitry of R14 and R13 may be found in early models. The adjustment is still the same.

TOTAL DRAIN $16\frac{1}{2}$ M.A. V.C. ZERO

ALIGNMENT

The I.F. frequency is 470K c/s. A signal may be applied at the live point of VC1 (tuning condenser, antenna section) or at any of the base connections of TR1, 2, or 3, via an isolating condenser of .01 mfd., so that d.c. operating voltages will not be disturbed. It is recommended that the signal be applied at VC1, or the base of TR1, and I.F. transformers be adjusted in this order for maximum output. T5, T4, T3/1, T3/2. There are no neutralizing adjustments.

RF alignment is made at 600 Kc/s and 1364 Kc/s. There are markers on the scale. Connect the signal generator via a 100K to 220K resistor directly to the live side of VC1 (antenna tuning condenser) and adjust C11 at 1364 Kc/s and T2 at 600 Kc/s for calibration purposes. Pointer should line up with end of scale when gang is closed. Adjust C2 at 1364 Kc/s for max. sensitivity, and if necessary adjust one portion of T1 by sliding it along the ferrite rod for maximum sensitivity at 600 Kc/s. Direct connection of signal generator to external aerial connection is not recommended for maximum sensitivity adjustments.

MURPHY MODEL P71 ELECTRICAL COMPONENTS

PARTS LISTAbbreviations

cer.	-	ceramic	elect.	-	electrolytic
p.s.m.	-	protected silver mica	v.d.c.	-	d.c. voltage rating
tub.	-	paper tubular	W.	-	wattage rating
m.tub.	-	metallised paper tubular	lin.	-	linear law
log.	-	logarithmic law			

Part No.	Circuit No.	Value	Tolerance & Remarks
66775	C1	10 pfd.	± 1 pf. cer. 750 v.d.c.
--	C2	trimmer	on VC1
49454	C3	.04 mfd.	150 v.d.c. m.tub.
49454	C4	.04 mfd.	150 v.d.c. m.tub.
49454	C5	.04 mfd.	150 v.d.c. m.tub.
--	C6	250 pfd.	(Part of T3/1)
RP2408	C7	480 pfd.	S.M. $\pm 1\%$ 350v.
66161	C8	22 pfd.	20% cer. 750 v.d.c.
28187	C9	5 pfd.	± 1 pf. S.M. 350v.
--	C10	250 pfd.	(Part of T3/2)
--	C11	trimmer	on VC2
RP2405	C12	8 mfd.	6 v.d.c. electrolytic
RP2407	C13	14 pfd.	± 1 p.f. S.M. 350v.
49454	C14	.04 mfd.	150 v.d.c. m.tub.
--	C15	250 pfd.	(Part of T4)
49454	C16	.04 mfd.	150 v.d.c. m.tub.
28340	C17	22 pfd.	$\pm 2\%$ S.M. 350v.
--	C18	250 pfd.	(Part of T5)
49454	C19	.04 mfd.	150 v.d.c. m.tub.
49454	C20	.04 mfd.	150 v.d.c. m.tub.
49455	C21	.02 mfd.	150 v.d.c. m.tub.
49455	C22	.02 mfd.	150 v.d.c. m.tub.
RP2404	C23	1000 mfd.	6 v.d.c. electro
49443	C24	.5 mfd.	150 v.d.c. m.tub.
49455	C25	.02 mfd.	150 v.d.c. m.tub.
RP2406	C26	32 mfd.	1.5 v.d.c. electro
RP2409	C27	50 mfd.	6 v.d.c. electro
49454	C28	.04 mfd.	150 v.d.c. m.tub.
49454	C29	.04 mfd.	150 v.d.c. m.tub.
49444	C30	1 mfd.	150 v.d.c. m.tub.
49454	C31	.04 mfd.	150 v.d.c. m.tub.
49454	C32	.04 mfd.	150 v.d.c. m.tub.

C32 is connected between the emitter of TR3 and the common + line.

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Part No.	Circuit No.	Value	Tolerance & Remarks
RP3253	R1	16 K ohm	± 5% Y9
RP3254	R2	2.2 K ohm	± 5% Y9
24091	R3	820 ohm	± 10% Y9
26821	R4	470 ohm	± 20% Y9
RP3255	R5	3 K ohm	± 5% Y9
25093	R6	2.7 K ohm	± 10% Y9
24933	R7	1 K ohm	± 10% Y9
RP3257	R8	10 K ohm	± 5% Y9
RP3255	R9	3 K ohm	± 5% Y9
28423	R10	330 ohm	± 5% Y9
25253	R11	6.8 K ohm	± 10% Y9
26693	R12	100 ohm	± 20% Y9
25445	R13	22 K ohm	± 10% Y9
RP3403	R14	20 K ohm	pre-set pot. Egen type 172
24933	R15	1 K ohm	± 10% Y9
25445	R16	22 K ohm	± 10% Y9
25317	R17	10 K ohm	± 10% Y9
26693	R18	100 ohm	± 20% Y9
24741	R19	330 ohm	± 10% Y9
RP3402	R20	5 K ohm	pre-set pot. Egen type 172
24485	R21	68 ohm	± 10% Y9
RP3476	R22	Mullard type VA 1039	thermistor
RP3261	R23	4.7 ohm	± 10% Y9

Miscellaneous

RP3451	VC1)	Tuning condenser
	VC2)	
RP2015	VR1 & S1	Volume control and switch (1K log.)
RP2016	VR2	Tone control (1K log.)
RP3487	X1	Overload diode CGL2E (Red Spot)
RP3486	X2	Detector diode CGL2E (Black Spot)
RA3531	T1	Antenna coil
RP3526	T2	Oscillator coil
RP3527	T3/1	I.F. transformer
RP3528	T3/2	I.F. transformer
RP3529	T4	I.F. transformer
RP3530	T4	I.F. transformer
* RW3532	T6	Driver transformer *
RW3533	T7	Output transformer
RA3466	L.S.	5" loudspeaker B570/2971
RP2352	TR1	Transistor Ediswan XA102
RP2351	TR2	Transistor Ediswan XA101
RP2351	TR3	Transistor Ediswan XA101
RP2353	TR4	Transistor Ediswan XB102
RP2354	TR5	Transistor Ediswan XB103
RP2355	TR6 & 7	Transistor Ediswan XC131 (pair)

continued...

P71 Components other than electrical

Part No.

RP3626	Battery, dry cell type 950 (4 required)
RP2312	Battery terry clip
RM3510	Battery terminal clip, negative
RM3511	Battery terminal clip, positive
RM3503	Battery tube
RM3519	Bracket, antenna
RA3507	Cabinet, complete assembly (state colour)
RC3506	Cabinet, bare, (state colour)
RP2313	Catch, terry clip, lid
RP3521	Clip, trim
RP1209	Dial cord, 24 ins., nylon/glass fibre
RP3504	Dial scale
RP1774	Felt Washer, knob, white
RP1775	Felt Washer, pointer tip, white
RP3376	Ferrite rod
RP2803	Grille cloth, 12" x 8", "Vynair" white design 427
RP3508, 3516, 3517	Handle, Green/Blue/Lt. Beige respectively
RP2992	Hinge, lid, 1" x $\frac{5}{8}$ "
RP3386	Knob, white/gold, 1" dia.
RP3143	Plug, aerial, Clix type MP1, black
RM3505	Pointer
RP1739	Rubber foot
RP1629	Screw, wood, fixing baffle. No. 5 x $\frac{1}{2}$ " Ph.R.Hd.
RP1942	Screw, wood, fixing hinge. No. 2 x $\frac{3}{8}$ " Csnk. Hd.
RP2828	Trim, around case (64 ins. total)
RP2827	Trim, around aperture (33 ins. total)

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ENGINEERING CHANGE NOTICE NO. 0147

MURPHY RADIO MODEL P71 TRANSISTOR PORTABLE

DESCRIPTION OF CHANGE.

Transistor Ediswan XC131 replaced by 2 only GET114, G.E.C. Transistors.

REASON FOR CHANGE

Supply position.

CHANGE TO BECOME EFFECTIVE FROM:

Serial No. 001901.

DETAILS OF CHANGE.

S/L RA3539 Assy. of Audio Chassis Wired, P71

Sheet 1.

Item 32 change to

RP23566, Transistor GET114, 2 per, B.G.E.

Cancel Items 35, 37, and 39.

Circuit diagram RP3551:-

TR6 & TR7 become GET114.

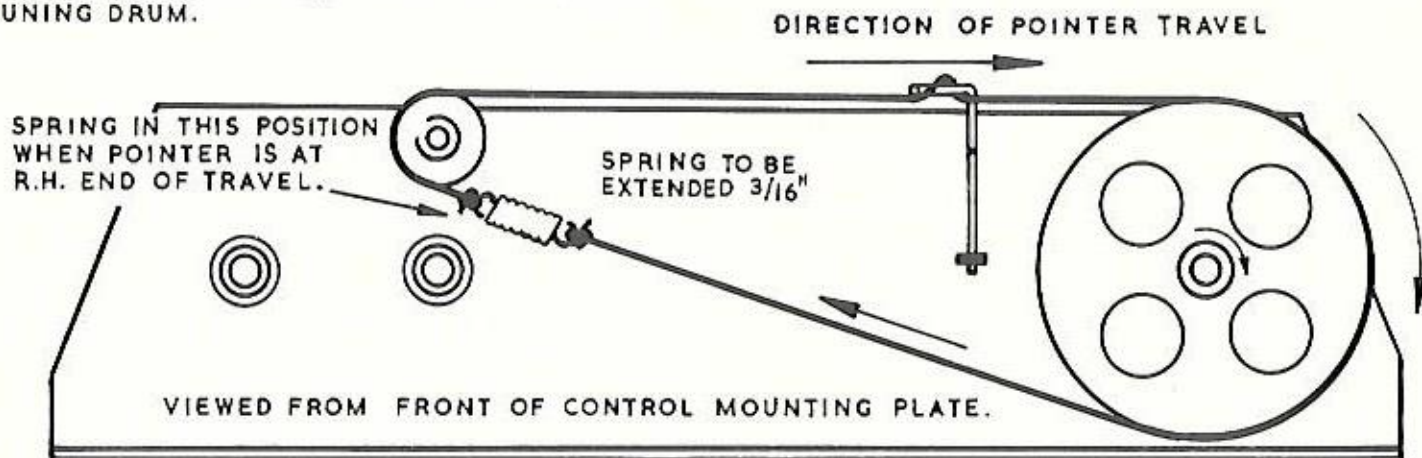
2 of Type GET114 will directly replace XC131 in circuit, but R20 will have to be adjusted in case of replacement as per service instructions.

FISHER & PAYKEL LIMITED.

METHOD OF REPAIRING P71 TYPE CORD DRIVE

- 1 - CUT 20" LENGTH OF GLASS/NYLON DRIVE CORD.
- 2 - MAKE UP LOOP 16.7/8" LONG INCLUDING SPRING. SECURELY TIE A SINGLE KNOT AT EACH END.
- 3 - WRAP CORD AROUND PULLEY & DRUM AS SHOWN, WITH SPRING ON LOWER PART OF LOOP.
- 4 - TWIST CORD ROUND TOP OF POINTER AS SHOWN IN SMALL SKETCH (WHILE CORD IS IN POSITION).
- 5 - ADJUST CORD TO HALF-WAY BACK ON FLANGE OF TUNING DRUM.

- 6 - CHECK THAT BOTH SPRING AND POINTER HAVE A LITTLE CLEARANCE AT EACH END OF TRAVEL.
- 7 - COAT KNOTS WITH QUICK-DRYING ADHESIVE.
- 8 - SET POINTER AT RIGHT-HAND END OF TRAVEL, I.E. GANG CONDENSER FULLY CLOSED, AND ADJUST TO COINCIDE WITH R.H. END OF DIAL APERTURE WHEN ASSEMBLED INTO CABINET.



CORD DRIVE ARRANGEMENT DIAGRAM-
MURPHY TRANSISTOR PORTABLE MODEL P71





SERVICE BULLETIN

BULLETIN L. 13

DATE 14 February, '67

PRODUCT CHANGE NOTICE

*To Griffiths
Radio
Lom*

APPLIANCE Murphy Transistor Portable P71
PART NAME All Transistors
PART NO. As listed below
CHANGE EFFECTIVE For future Service only.

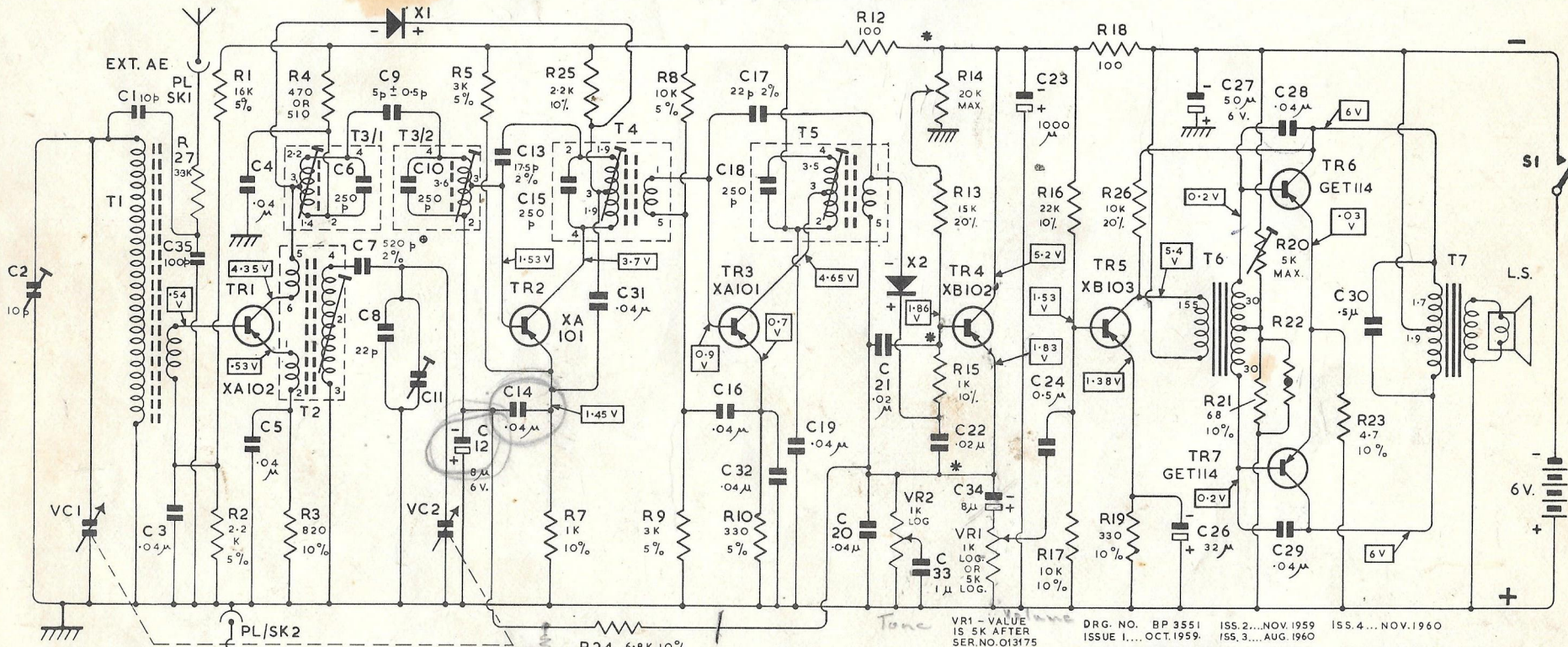
REASON FOR CHANGE :

Due to the fact that Ediswan ceased manufacture of the XA series of transistors some years ago and that G.E.C. were Amalgamated with Mullard, the following list of recommended transistors for replacing those used on the P71 are supplied herewith.

<u>P71 TYPE</u>	<u>ALTERNATIVE TYPES</u>
XC131 (RP2355)	2XAC117 (XP2373)
GET114 (RP2356)	2XAC117 (XP2373)
XB103 (RP2354)	2N408 (XP2365) OR 2SB54 (XP2360)
XB102 (RP2353)	2N406 (XP2363) OR 2N408 (XP2365) OR 2SB54 (XP2360)
XA101 (RP2351)	2N410 (XP2364) OR 2SA49 (XP2357) OR 2SA53 (XP2359)
XA102 (RP2352)	2N412 (XP2366) OR 2SA52 (XP2358)
CG12E (Red Spot) (XP3487)	0A160 (XP3495) OR 1N60 (XP3488)
CG12E (Black ") (XP3486)	0A160 (XP3495) OR 1N60 (XP3488)

Types listed have all been used on other Murphy models.

C	2	1	3	35	4,5	6,7,8,9,10,11,12	13,14	15	31	16,17,18,19,32	20,33,21,22	34	23	24	,26,27	28,29	30	CAPACITORS				
R		27	1,2	3	4	5	7	24,25	8,9	10	12	3,14,15	16,17,18,19,26	20,21,22	23			RESISTORS				
MISC.	VC1	TI	AE	SKI	SK2	TR1	T2	T3/1	XI	T3/2	VC2	TR2	T4	TR3	T5	X2,VR2,TR4,VR1	TR5	T6	TR6,7	T7	LS	SI



NOTE:-
THE POWER SWITCH S1 (SHOWN IN "OFF" POSITION) IS COUPLED WITH THE VOLUME CONTROL VR1.

CIRCUIT VOLTAGES, SHOWN WITHIN RECTANGLES, WERE MEASURED UNDER NO-SIGNAL CONDITIONS, USING A 20K /VOLT METER AND WITH A BATTERY SUPPLY OF 6 VOLTS.

CONNECTIONS BETWEEN AUDIO & RF BOARDS MARKED *

RESISTANCES ARE QUOTED IN OHMS. WHERE THE RESISTANCE OF A WINDING IS LESS THAN ONE OHM, THE VALUE IS NOT STATED.

INSTRUCTIONS FOR RE-ADJUSTMENT OF R14 & R20 ARE INCLUDED IN SERVICE INFORMATION.

*C7 IS 480p WITH 470 KC/S I.F. OR 520p WITH 455 KC/S I.F.

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REFER TO PARTS LIST FOR PART NUMBERS & COMPLETE DESCRIPTIONS OF ELECTRICAL COMPONENTS. ORDER ALL REPLACEMENTS BY PART NUMBER AND LIST DESCRIPTION.

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CIRCUIT DIAGRAM FOR MURPHY P71 TRANSISTOR RECEIVER

7-372