

5.—COMPONENT SCHEDULE

When ordering replacement parts, please quote ALL details given below for a particular component, TOGETHER WITH the unit type No. and the Circuit Ref. No. of component.

The component supplied against the order may not be identical with the original item in the equipment, but will be a satisfactory replacement differing in only minor mechanical or electrical details; such differences will not impair the operation of the equipment.

NOTE: Resistors described as "Composition Grade 1" and "Composition Grade 2" are made by various manufacturers to RCS standards. "Vitreous enamelled" resistors are completely identified by the "RWV" type number given, and also produced by several manufacturers to a common specification.

Acceptable manufacturers of these resistors are listed below.

Wattage ratings are quoted at 71°C.

Composition Grade 1

1/8W insulated
1/4W insulated
1/4W non-insulated
1/2W insulated
3/4W non-insulated

1W non-insulated

Composition Grade 2

1/4W insulated
1/2W insulated
1/2W non-insulated
1W insulated
1W non-insulated

Vitreous Enamelled

Description according to type number

Manufacture and Type

Erie 109
Erie 108
I.R.C. type DCC
Welwyn C21
Painton 72
Erie 100
I.R.C. type DCE
Welwyn C23
Painton 74
I.R.C. type DCG
Welwyn C24
Painton 75

I.R.C. type BTS
I.R.C. type BTA
Morganite T
I.R.C. type BTB
Morganite R

I.R.C.
Reco
Ducon

5.1 R.F. Coil Unit 1C60602 (For CR-6A Receiver)

COMPONENTS

DESCRIPTION

A.W.A. PART No. Unless otherwise stated

(a) Capacitors

C1 Not used.
C2 47 μ F $\pm 5\%$, 500VW, cer., tub.
C3 100 μ F $\pm 5\%$, 600VW, plastic film
C4 150 μ F $\pm 5\%$, 600VW, plastic film
C5 Not used.
C6 150 μ F $\pm 5\%$, 600VW, plastic film
C7 200 μ F $\pm 5\%$, 600VW, plastic film
C8 Not used.
C9 Not used.
C10 Not used.
C11 470 μ F $\pm 5\%$, 600VW, plastic film
C12 290 μ F $\pm 5\%$, 600VW, plastic film
C13 180 μ F $\pm 5\%$, 600VW, plastic film
C14 150 μ F $\pm 5\%$, 600VW, plastic film
C15 Not used.

Ducon CTR. NPO
Ducon Styroseal
Ducon Styroseal

Ducon Styroseal
Ducon Styroseal

Ducon Styroseal
Ducon Styroseal
Ducon Styroseal
Ducon Styroseal

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
C16	3-50 μ F, variable, miniature, air dielectric	Plessey CVA50
C17	Variable, 3-gang	60602X17
C18	Not used.	
C19	15 μ F \pm 1 μ F, 500VW, cer., tub.	Ducon CTR. NPO
C20	Not used.	
C21	68 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C22	110 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C23	100 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C24	150 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C25	Not used.	
C26	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C27	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C28	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C29	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C30	Not used.	
C31	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C32	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C33	Not used.	
C34	Not used.	
C35	Not used.	
C36	470 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C37	290 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C38	180 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C39	150 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C40	Not used.	
C41	33 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C42	15 μ F \pm 1 μ F, 500VW, cer., tub.	Ducon CTR. NPO
C43	15 μ F \pm 1 μ F, 500VW, cer., tub.	Ducon CTR. NPO
C44	47 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C45	Not used.	
C46	68 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C47	82 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C48	120 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C49	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C50	Not used.	
C51	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C52	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C53	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C54	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C55	Not used.	
C56	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C57	420 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C58	1200 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C59	390 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C60	Not used.	

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
C61	370 μ F, $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
C62	220 μ F, $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
C63	180 μ F $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
C64	Not used.	
C65	Not used.	
C66	33 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C67	100 μ F $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
C68	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C69	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C70	Not used.	
C71	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C72	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C73	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C74	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C75	Not used.	
C76	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C77	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C78	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C79	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C80	Not used.	
C81	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C82	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C83	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C84	100 μ F $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
(b) Inductors		
L1		462V57962
L2		461V57962
L3		460V57962
L4		459V57962
L5	Not used.	
L6		458V57962
L7		457V57962
L8		5V57973
L9		5V57973
(c) Resistors		
R1	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R2	330 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R3	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R4	100k Ω $\pm 10\%$, 1W, comp., grade 2, ins.	
R5	Not used.	
R6	10k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R7	330 Ω $\pm 10\%$, 1/4, comp., grade 2, ins.	
R8	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R9	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R10	Not used.	

COMPONENTS

DESCRIPTION

A.W.A. PART No.
Unless otherwise stated

R11	Not used.
R12	5.6k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R13	10k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R14	12k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R15	Not used.
R16	22k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R17	27k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R18	100 Ω \pm 10%, 1/4W, comp., grade 2, ins.

(d) Transformers

TR1		456V57962
TR2		455V57962
TR3		454V57962
TR4		453V57962
TR5	Not used.	
TR6		452V57962
TR7		451V57962
TR8		468V57962
TR9		467V57962
TR10	Not used.	
TR11		466V57962
TR12		465V57962
TR13		464V57962
TR14		463V57962

(e) Miscellaneous

V1	Valveholder, 9 pin, miniature P.T.F.E.	
V2	Valveholder, 9 pin, miniature P.T.F.E.	Clix VH499/902 CPS
SWA	Oak H type	Clix VH499/902 CPS
		60602V64

5.2 R.F. Coil Unit 2C60602 (For CR-6B Receiver)

The component schedule is the same as for R.F. Coil Unit 1C60602 with the following exceptions:

(a) Capacitors

C14	Not used.	
C24	Not used.	
C39	Not used.	
C48	100 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C63	100 μ F \pm 5%, 600VW, plastic film	Ducon Styroseal
C70	0.1 μ F \pm 10%, 400VW, polyester, tubular	Philips C296 AC

(b) Inductors

L7	Not used.	
L8	Not used.	
L10	Not used.	
L11		21V57963

(c) Resistors

R5	22k Ω \pm 10%, 1/4W, comp., grade 2, ins.
R11	100k Ω \pm 10%, 1/4W, comp., grade 2, ins.
R12	6.8k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R13	8.2k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R14	18k Ω \pm 10%, 1/2W, comp., grade 2, ins.
R17	100k Ω \pm 10%, 1/4W, comp., grade 2, ins.

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
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(d) Transformers

TR7	Not used.	
TR14	Not used.	
TR16		20V57963
TR17		22V57963

5.3 Receiver CR-6 Series C60600

The components in this section are the same for the CR-6A and CR-6B Receivers.

(a) Capacitors

C101	Not used.	
C102	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C103	100 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C104	47 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C105	4-25 μ F, variable, miniature, air dielectric	Philips 82755/25E
C106	1 μ F \pm 1/2 μ F, 500VW, cer., bead	Ducon CBA. NPO
C107	Not used.	
C108	24 μ F -20+50%, 300VW, electro, tub., met. case	Ducon ET
C109	24 μ F -20+50%, 300VW, electro, tub., met. case	Ducon ET
C110	Not used.	
C111	Not used.	
C112	Not used.	
C113	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C114	100 μ F \pm 10%, 600VW, plastic film	Ducon Styroseal
C115	Not used.	
C116	100 μ F \pm 10%, 600VW, plastic film	Ducon Styroseal
C117	100 μ F \pm 10%, 600VW, plastic film	Ducon Styroseal
C118	2.2 μ F \pm 5%, 500VW, cer. bead	Ducon CBA. NPO
C119	2.2 μ F \pm 5%, 500VW, cer. bead	Ducon CBA. NPO
C120	Not used.	
C121	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C122	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C123	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C124	0.1 μ F \pm 10%, 125VW, polyester, tub.	Philips C296AA/A
C125	Not used.	
C126	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C127	47 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C128	47 μ F \pm 5%, 500VW, cer., tub.	Ducon CTR. NPO
C129	0.1 μ F \pm 10%, 125VW, polyester, tub.	Philips C296AA/A
C130	Not used.	
C131	0.1 μ F \pm 10%, 125VW, polyester, tub.	Philips C296AA/A
C132	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C133	100 μ F \pm 10%, 500VW, cer. tub.	Ducon CTR. N750
C134	0.1 μ F \pm 10%, 125VW, polyester, tub.	Philips C296AA/A
C135	Not used.	

COMPONENTS

DESCRIPTION

A.W.A. PART No.
Unless otherwise stated

C136	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C137	5-100 μ F, variable, miniature, air dielectric	Polar C8-04
C138	620 μ F $\pm 10\%$, 600VW, plastic film	Ducon Styroseal
C139	100 μ F $\pm 10\%$, 600VW, plastic film	Ducon Styroseal
C140	Not used.	
C141	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C142	100 μ F $\pm 10\%$, 500VW, cer. tub.	Ducon CTR. N750
C143	100 μ F $\pm 10\%$, 500VW, cer. tub.	Ducon CTR. N750
C144	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C145	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C146	430 μ F $\pm 5\%$, 400VW, plastic film	Ducon Styroseal
C147	0.01 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C148	100 μ F $\pm 10\%$, 500VW, cer. tub.	Ducon CTR. N750
C149	24 μ F $-20+50\%$, 300VW, electro, tub. met. case	Ducon ET
C150	8 μ F $-20+50\%$, 300 VV, electro. tub. met. case	Ducon ET
C151	470 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C152	0.01 μ F $-0+100\%$, 500VW, cer., tub.	Ducon CTR. K6000
C153	0.47 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C154	470 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C155	Not used.	
C156	100 μ F $\pm 5\%$, 600VW, plastic film	Ducon Styroseal
C157	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C158	Not used.	
C159	4700 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C160	Not used.	
C161	0.01 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C162	1000 μ F $\pm 10\%$, 400VW, polyester, tub.	Philips C296AC/A
C163	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C164	0.01 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C165	Not used.	
C166	25 μ F, 18VW, electrolytic, subminiature, tub. met. case	Ducon EW0406
C167	0.01 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C168	25 μ F 18VW, electro. miniature, tub. met. case	Ducon EW0406
C169	0.1 μ F $\pm 10\%$, 125VW, polyester, tub.	Philips C296AA/A
C170	4700 μ F $\pm 10\%$, 400VW, plastic film	Ducon Styroseal
C171	0.01 μ F $-0+100\%$, 500VW, ceramic, tubular	Ducon CTR.K6000
(b) Inductors		
L101		202V57970
L102		202V57970
L103		202V57970
L104	Not used.	
L105		3V57964
L106		1LE61077
(c) Rectifiers		
MR101	Silicon type	Westinghouse 1N1169
MR102	Silicon type	Westinghouse 1N1169
MR103	Silicon type	Westinghouse 1N1169
MR104	Silicon type	Westinghouse 1N1169
MR105	Silicon type	Philips OA202

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
MR106	Silicon type	Philips OA202
MR107	Silicon type	Philips OA202
MR108	Silicon type	Philips OA202
MR109	Silicon type	Philips OA202
(d) Resistors		
R101	Not used.	
R102	470k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R103	220k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R104	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R105	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R106	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R107	Not used.	
R108	2.2k Ω $\pm 10\%$, 1W, comp., grade 2, ins.	
R109	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R110	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R111	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R112	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R113	470 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R114	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R115	Not used.	
R116	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R117	330 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R118	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R119	10k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R120	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R121	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R122	330 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R123	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R124	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R125	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R126	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R127	33k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R128	15k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R129	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R130	1M Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R131	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R132	330 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R133	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R134	820 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R135	1M Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R136	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R137	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R138	33k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R139	1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R140	10k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R141	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R142	47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R143	4.7k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R144	150k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.	
R145	1k Ω $\pm 5\%$, 1/4W, carbon film	Philips B8-305-05B

COMPONENTS

DESCRIPTION

A.W.A. PART No.
Unless otherwise stated

R146 33k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R147 330 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R148 22k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R149 47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R150 Not used.

R151 1M Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R152 220k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R153 47k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R154 220k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R155 Not used.

R156 680k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R157 470k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R158 220k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R159 1.5k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R160 Not used.

R161 1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R162 470k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R163 470k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R164 220 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R165 Not used.

R166 100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R167 100 Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R168 1k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
 R169 100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.

RV1 500 Ω , variable, 1/16W, comp., log. law
 RV2 500 Ω , variable, 1/16W, comp., log. law

Ducon PTU
 Ducon PTU

RV101 2.5k Ω variable, 1W, wire wound, linear law
 RV102 500k Ω , variable, 1/2W, comp., linear law, includes switch 1SWC
 RV103 500k Ω , variable, 1/4W, comp., log. law, includes switch 1SWD

Colvern CLR4201/22F
 Ducon PSU
 Ducon PSU

(e) Sockets

V101 7 pin, miniature, P.T.F.E.
 V102 7 pin, miniature, P.T.F.E.
 V103 9 pin, miniature, P.T.F.E.
 V104 7 pin, miniature, P.T.F.E.
 V105 7 pin, miniature, P.T.F.E.
 V106 7 pin, miniature, P.T.F.E.
 V107 7 pin, miniature, P.T.F.E.
 V108 9 pin, miniature, P.T.F.E.
 V109 7 pin, miniature, P.T.F.E.
 V110 7 pin, miniature, P.T.F.E.
 XL101 2 pin, miniature, bakelite
 XL102 2 pin, miniature, bakelite

Clix VH337/702 CPS
 Clix VH337/702 CPS
 Clix VH499/902 CPS
 Clix VH337/702 CPS
 Clix VH337/702 CPS
 Clix VH337/702 CPS
 Clix VH337/702 CPS
 Clix VH499/902 CPS
 Clix VH337/702 CPS
 Clix VH337/702 CPS

McMurdo type D
 McMurdo type D

(f) Switches

SWA Refer 5.1
 SWB Oak, H type
 1SWA Oak, H type
 1SWB Oak, H type
 1SWC S.P.D.T., part of RV102
 1SWD D.P.S.T., part of RV103

60602V41
 60600V72
 60600V72

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
(g) Transformers		
TR101		1TJ61122
TR102		4V57964
TR103		1LE61123
(h) Miscellaneous		
FILT.	100 kc/s, filter (refer 5.4)	1Q60603
FS1	Fuse, glass cartridge type, 0.5 A	Alert Anti-surge
JKA	Jack, panel type	Bulgin J18
1LP101 to 1LP105	Pilot lamps, 6.3V 0.15 A, M.E.S. base, tubular	
M101	Meter, moving coil, 1mA movement, 100 ohm. res., calib. in air, range 0-100 db.	60600V81

5.4 100 kc/s Filter Unit 1Q60603

(a) Capacitors

C201	1400 μ F $\pm 5\%$, 200VW, plastic film	Ducon Styroseal
C202	2800 μ F $\pm 5\%$, 200VW, plastic film	Ducon Styroseal
C203	2800 μ F $\pm 5\%$, 200VW, plastic film	Ducon Styroseal
C204	2800 μ F $\pm 5\%$, 200VW, plastic film	Ducon Styroseal
C205	1400 μ F $\pm 5\%$, 200VW, plastic film	Ducon Styroseal
C206	0.01 μ F $-0+100\%$, 500VW, cer., tub.	Ducon CTR. K6000
C207	0.01 μ F $-0+100\%$, 500VW, cer., tub.	Ducon CTR. K6000
C208	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C209	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C210	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C211	10 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C212	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C213	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C214	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C215	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C216	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C217	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C218	10 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C219	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C220	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C221	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C222	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C223	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C224	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C225	10 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C226	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C227	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C228	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C229	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C230	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO

COMPONENTS	DESCRIPTION	A.W.A. PART No. Unless otherwise stated
C231	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C232	10 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C233	47 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C234	22 μ F $\pm 5\%$, 500VW, cer., tub.	Ducon CTR. NPO
C235	15 μ F $\pm 1\mu$ F, 500VW, cer., tub.	Ducon CTR. NPO
C236	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000
C237	0.01 μ F -0+100%, 500VW, cer., tub.	Ducon CTR. K6000

(b) Inductors

L201	2V57964
L202	1V57964
L203	1V57964
L204	1V57964
L205	2V57964

(c) Resistors

R201	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R202	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R203	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R204	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R205	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R206	120k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.
R207	100k Ω $\pm 10\%$, 1/4W, comp., grade 2, ins.

**CRYSTAL OSCILLATOR UNIT
TYPE 1C60604**

010561

HANDBOOK 60604R

AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED
Engineering Products Division
422 LANE COVE ROAD, NORTH RYDE, N.S.W.

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Crystal Oscillator Unit type 1C60604 Circuit	60604D1

1.—GENERAL DESCRIPTION

1.1 Application

The A.W.A. Crystal Oscillator Unit type 1C60604 is specially designed to supplement the resources of the General Purpose Communication Receiver CR-6, series C60600. It may be fitted to the receiver to provide up to six crystal-locked receiving frequencies anywhere within the range of the receiver.

With this facility the receiver is converted to a highly stable unit suitable for the reception of fixed services such as radio telephone networks using amplitude modulation. The receiver is also suitable for the reception of single-sideband and frequency shift keying signals with the local 100 kc/s oscillator used as a carrier re-insertion generator. Fine tuning may be carried out using the B.F.O. control and the vernier FREQ. CONTROL on the oscillator unit.

The oscillator unit is supplied complete and may be fitted to the receiver with very little trouble, the necessary mounting holes being already provided in the chassis and front panel. Type "D" plug-in crystals are supplied for frequencies and tolerances as required. The crystals may be changed at any time without further modification to the equipment.

1.2 Mechanical Construction

The unit is assembled on a small chassis which carries the oscillator valve, the crystals and associated components, and a trimmer capacitor and band switch driven by concentric controls. Mounting holes are provided on the main chassis of the receiver to take the crystal oscillator unit; the sub-panel and the front panel are drilled for the control spindles and the unit is mounted by means of two 4 BA screws.

When the front cover panel is not stencilled for the crystal oscillator controls, an adhesive plate is supplied with the designations printed on it.

The concentric controls take the form of a knob operating the trimmer capacitor and a lever type control to operate the crystal selector switch. The MANUAL position of this switch disconnects the crystal oscillator and converts the receiver to the continuously tunable condition.

1.3 Technical Description

The crystal oscillator circuit comprises a half-12AU7 type valve with the crystal connected between anode and grid in a Pierce circuit. The crystals are switched by SWA, and in the crystal positions, the unit is connected to the first mixer valve so that the variable oscillator (triode section of V2 in the R.F. Coil Unit) now acts as an amplifier for the crystal oscillator, or as a doubler-amplifier if the receiver circuits are tuned to twice the fundamental frequency. The trimmer capacitor C2 is used as a fine frequency control and is adjusted for each channel by the FREQ. CONTROL knob.

A compensating circuit is provided to maintain a constant shunt capacitance across the mixer tuned

circuit under all conditions. When the unit is fitted, the fixed shunt capacitor C42 ($15\mu\text{F.}$) is removed from the mixer tuned circuit. The two coaxial leads to the oscillator unit each have a shunt capacitance of approximately $7.5\mu\text{F.}$ to earth. In the MANUAL position of the switch the inner conductors are connected together by SWA and the shunt capacitance is then $15\mu\text{F.}$ In the crystal positions one of these leads is open circuited, and the compensating capacitor C1 is then switched across the tuned circuit to provide an equivalent capacitance. This compensating capacitor is adjusted on installation as described in sub-section 2.3.

A protective cathode bias is provided to avoid excessive current in the crystal oscillator valve in the event of selection of a switch position for which no crystal is fitted.

1.4 Crystals

The crystals supplied are type "D," with frequency and tolerance as specified, and adjusted for a shunt capacitance of $30\mu\text{F.}$ When ordering, full details of frequency, tolerance and operating temperature range should be supplied.

The frequencies may be anywhere within the range of the receiver, and may be on any band or combination of bands. The crystal required for any frequency f may be calculated as follows:

(a) Double Sideband plus Carrier (AM)

Signal Frequency (f) (Mc/s)	Crystal Frequency (Mc/s)
2 to 14.2	$f + 1.8$
14.2 to 15	$f + 1.8$
	2
15 to 17.8	$f - 1.8$
17.8 to 30	$f - 1.8$
	2

Tolerance $\pm 0.01\%$ from $+10^\circ\text{C.}$ to $+60^\circ\text{C.}$

(b) SSB Reception

If the unit is required to receive SSB signals it will be necessary to know whether upper or lower sideband reception is required.

Signal Frequency (f) (Mc/s)	Crystal Frequency (Mc/s)	
	Upper Sideband	Lower Sideband
2 to 14.2	$f + 1.8015$	$f + 1.7985$
14.2 to 15	$f + 1.8015$	$f + 1.7985$
	2	2
15 to 17.8	$f - 1.8015$	$f - 1.7985$
17.8 to 30	$f - 1.8015$	$f - 1.7985$
	2	2

Tolerance $\pm 0.005\%$ from $+10^\circ\text{C.}$ to $+60^\circ\text{C.}$

2.—INSTALLATION AND OPERATION

2.1 Installation

To install the crystal oscillator unit, remove the receiver from the case or rack and proceed as follows:

1. The front panel is drilled to take the control spindles, and a removable plug is fitted to the hole when not in use. This hole is on the right hand side of the panel, directly above the R.F. GAIN control. Remove the plug.
2. Slide the unit in from the rear so that the spindles project through the hole to the front panel and the chassis is over the mounting holes in the main chassis of the receiver. Screw in position with the two 4 BA screws, washers and nuts supplied, aligning the unit so that the spindles are free in the front panel hole.
3. If the panel is not already stencilled, fix the adhesive plate supplied, with the 0 of the FREQ. CONTROL scale vertical.
4. Fit the switch lever, with the window showing MANUAL when the switch is in the extreme anti-clockwise position. Fit the FREQ. CONTROL knob over the inner spindle and align the pointer to F crystal channel when the trimmer capacitor is fully in mesh.

2.2 Connections

In order to complete the wiring of the unit to the receiver it will be necessary to remove the rearmost partition from the r.f. coil box. This is done by unscrewing the four screws holding the partition to the chassis. An insulating post will be found adjacent to pins 6 and 7 of V2 on the R.F. Coil Unit. The tags on the terminal board on the side of the r.f. coil box (TSA in Drg. 60602C1) are numbered from the rear of the unit.

CAUTION. The greatest care must be exercised when soldering the coaxial leads. It is essential to use a small soldering iron with a clean, well tinned bit, so as to avoid damage to the insulation of the cables, the r.f. coils and the Styrofoam capacitors. All of these can be damaged by excessive heat or accidental contact with the soldering iron.

1. Connect the leads from the crystal oscillator unit as follows:
 - (a) Brown lead (heater) to TSA5 on R.F. Coil Unit.
 - (b) Red lead (150V. h.t.) to TSA7 on R.F. Coil Unit.
 - (c) Coaxial cable (green sleeve) to insulated post on R.F. Coil Unit.
 - (d) Coaxial cable (plain) to pin 7, V2 on R.F. Coil Unit.
 - (e) Coaxial screening braids to earth tag on the oscillator coil nearest V2.

NOTE. Do not shorten the coaxial leads; the length has been adjusted to provide the correct shunt capacitance.

2. Transfer C84 from pin 7 of V2 to the insulated post.
3. Remove C42 ($15\mu\text{F.}$) from the R.F. Coil Unit.

2.3 Alignment

After the crystal oscillator unit has been fitted, switch to MANUAL and carefully check the calibration of the receiver. The r.f. circuits have not been disturbed and should not require any attention, but it may be necessary to make some slight adjustments to the oscillator section, using the built-in crystal calibrator and following the instructions on R.F. Alignment, sub-section 4.4 in the Receiver Handbook.

As explained above in sub-section 1.3, the two coaxial leads provide an effective shunt capacitance of $15\mu\text{F.}$ across the oscillator tuned circuit when the selector switch is in the MANUAL position. In the crystal positions, one of these leads is open-circuited, and $7.5\mu\text{F.}$ is removed from the tuned circuit and replaced by the compensating trimmer capacitor C1. To adjust this compensating capacitor, proceed as follows:

1. Select a crystal which will give a signal frequency on the high end of any band (e.g., 11.8 Mc/s crystal for 10 Mc/s signal frequency).
2. Plug in the crystal and set the selector switch to the appropriate position. Set the FREQ. CONTROL to 0.
3. Plug an 0-100 $\mu\text{A.}$ meter into TJA (pin jacks at the rear of the R.F. Coil Unit).
4. Set the dial pointer accurately to the signal frequency of the selected crystal (10 Mc/s) in the example).
5. Peak trimmer C1 on the oscillator unit for maximum reading on the $\mu\text{A.}$ meter.

This compensating adjustment is only required when the crystal oscillator unit is first installed. No adjustment is required thereafter.

2.4 Operation

To operate on a crystal-locked frequency, turn the selector switch to the channel required, the FREQ. CONTROL to 0 and then manually tune the receiver to the channel frequency, as described in the receiver handbook, sub-section 3.6. Tune the receiver for maximum noise output. If a signal is present on the channel, the receiver should be adjusted for maximum output as indicated on the signal strength meter. The FREQ. CONTROL may then be used as a fine tuning control.

When the crystal oscillator unit is switched out of circuit (MANUAL position of selector switch) the equipment operates as a conventional tunable receiver. The method of operation is then exactly as described in the receiver handbook.

3.—MAINTENANCE

3.1 General

The oscillator valve is a miniature type and the remarks on the handling of such valves, in sub-section 4.2 of the Receiver Handbook, apply to this unit.

The rotary switch may be cleaned and lubricated following the procedure given in sub-section 4.5 of the Receiver Handbook. If the inner spindle (controlling the trimmer capacitor) appears to bind on the outer spindle, as evidenced by a tendency of the FREQ. CONTROL knob to turn as the switch is rotated, it may be cleaned by removing the knob, dismounting the trimmer capacitor and withdrawing it complete with inner spindle from the rear. Thoroughly clean the inner spindle and the inside of the

hollow outer spindle; then check that the inner spindle is straight, and runs freely in the outer spindle. Apply a small quantity of switch lubricant to the inner spindle and then reassemble, taking care to adjust the trimmer capacitor so that its spindle is quite free and does not foul the outer spindle.

3.2 Voltages

The following voltages were measured with respect to earth (chassis) using a Voltomyst.

V1 pin 1 (anode) 150V

V1 pin 3 (cathode) 1.1V (protective bias)