

- SPECIAL VERSION -

Instruction Manual No. H 52018-404A

for

AM/FM SIGNAL GENERATORS

2018A & 2019A

(Extended LF carrier frequency range)

Code Nos. 52018-404A
52019-404G- Supplement for inclusion in the Service
Manual Vol. 2 No. H 52018-910P -

NOTE : Before using this modified manual check that the model number on the identification plate at the rear of the instrument agrees with the above code number.

1. In this version of the instrument the carrier frequency range has been extended from what was a usable min. range of 30 kHz to a specified min. range of 10 kHz. Modulation frequencies of up to 1 kHz are usable when the carrier frequency is selected to 10 kHz.

2. The following data specifies the performance of the single option on its own, see General supplement H 52018-400C for other options that may also be fitted. Additions should be made to the Service Manual where appropriate:-

PERFORMANCE DATA (Extended LF carrier range option)

<i>Characteristic</i>	<u>2018A version</u>	<i>Performance</i> <u>2019A version</u>
<u>Carrier frequency</u>		
Range :	10 kHz - 520 MHz	10 kHz - 1040 MHz
<u>RF output</u>		
Level :	±1 dB from 10 kHz to 520 MHz.	±1 dB from 10 kHz to 520 MHz. ±2 dB from 520 MHz to 1040 MHz.

In addition add to Amplitude modulation, Frequency response.

At 10 kHz carrier frequency AM is usable with up to 1 kHz mod. rate.

Service Manual H 52018-910P, Vol. 2Chap. 4

Page 1 : Add to the contents list; AC4/2 Output Amplifier 10 kHz - 1040 MHz.

Page 43 : Add the following technical description after para. 185.

AC4/2 Output amplifier, 10 kHz - 1040 MHz

Circuit diagram : Chap. 7, Fig. 28

The function of this board is similar to the AC4 Output amplifier described in Chap. 4, paras. 103-121 and the technical description is essentially the same except that design modifications have been incorporated to extend the frequency range. These are as follows:-

- (1) TR11, TR13 collector loads have been changed to resistor loads.
- (2) TR15 biasing arrangement has been altered to include TR20 as the collector load. As an active device this offers a high impedance load to all frequencies down to below 5 kHz.
- (3) Larger coupling capacitors C19, C22 and C30 help to achieve an improved low frequency response.
- (4) TR10 collector load has also been modified to include TR18 and TR19, a switched active load. At frequencies above the BFO band (2.0136 MHz) the active load TR18 is saturated by turning TR19 on. The collector voltage on TR10 is therefore approx. 13 volts and the collector is choke loaded by L8 and L9. Below 2.0135 MHz TR19 is turned off, TR18 provides the active load for TR10 and the collector voltage will be set to approx. 7 volts. The two bias conditions for TR10 (choke and active loading) result in a thermal transient caused by the differing collector voltages. This is minimized by mounting TR18 and TR10 on a common heat sink, since the net dissipation of TR10 and TR18 is approximately constant any thermal effects are negligible.
- (5) Values of C33 and C34 r.f. detector have been increased to extend low frequency accuracy.
- (6) Values of R74, R75, C47 have been altered to reduce the ALC bandwidth and improve its stability.
- (7) Front panel 'LIMIT' annunciator is set only when frequencies below 10 kHz are requested, not 80 kHz as with the standard version of the instrument.

Chap. 5

Calibration and fault finding procedures are identical to those given for the standard version of the instrument except for the r.f. level accuracy which should be checked at carrier frequency settings down to 10 kHz.

Chap. 6

Page 1 : Add to the contents list; Unit AC4/2 Output amplifier (10 kHz - 1040 MHz).

Page 71/72 : Replace the existing AC4 Unit parts list found on pages 39-44 with the replacement list AC4/2 included with this supplement or alternatively file after Fig. 1 on page 71/72.

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
Unit AC4/2	OUTPUT AMPLIFIER (10 kHz - 1040 MHz)	
When ordering, prefix circuit reference with AC4/2.		
	Complete unit	44828-803V
C1	CAP CER .039UF 50V 20% CHIP	26386-757H
C2	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C3	CAP CER .001UF 63V 10% PLATE	26383-585M
C4	CAP CER .039UF 50V 20% CHIP	26386-757H
C5	CAP CER .039UF 50V 20% CHIP	26386-757H
C6	CAP CER 2.2PF 63V .5PF PLATE	26343-457R
C7	CAP CER 100PF 63V 2% PLATE	26343-477V
C8	CAP CER .039UF 50V 20% CHIP	26386-757H
C9	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C10	CAP CER .001UF 63V 10% PLATE	26383-585M
C11	CAP CER .039UF 50V 20% CHIP	26386-757H
C12	CAP CER .039UF 50V 20% CHIP	26386-757H
C13	CAP CER 2.2PF 63V .5PF PLATE	26343-457R
C14	CAP CER 100PF 63V 2% PLATE	26343-477V
C15	CAP CER 4.7PF 63V .5PF PLATE	26343-461B
C16	CAP CER .001UF 63V 10% PLATE	26383-585M
C17	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C18	CAP ELEC .47UF 50V 20% SUB MIN	26421-104C
C19	CAP ELEC .22UF 50V 20% CHIP	26386-760H
C20	CAP CER .039UF 50V 20% CHIP	26386-757H
C21	CAP CER 1.8PF 63V .5PF PLATE	26343-456C
C22	CAP CER .22UF 50V 20% CHIP	26386-760H
C23	CAP CER 10PF 50V 5% CHIP	26343-767B
C24	CAP CER 100PF 63V 2% PLATE	26343-477V
C25	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C26	CAP ELEC .47UF 50V 20% SUB MIN	26421-104C
C27	CAP CER 4.7PF 63V .5PF PLATE	26343-461B
C28	CAP CER 4.7UF 63V .5PF PLATE	26343-461B
C29	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C30	CAP CER .22UF 50V 20% CHIP	26386-760H

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
C31	CAP CER 4.7PF 63V .5PF PLATE	26343-461B
C32	CAP CER 4.7PF 63V .5PF PLATE	26343-461B
C33	CAP CER .022UF 50V 20% CHIP	26386-759U
C34	CAP CER .022UF 50V 20% CHIP	26386-759U
C35	CAP PETP .1UF 63V 10% RAD MIN	26582-429F
C36	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C38	CAP PETP .1UF 63V 10% RAD MIN	26582-429F
C39	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C40	CAP PETP .01UF 63V 10% RAD MIN	26582-426N
C41	CAP PETP .1UF 63V 10% RAD MIN	26582-429F
C42	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C43	CAP CER .01UF 100V 20% DISC	26383-055L
C44	CAP CER .01UF 100V 20% DISC	26383-055L
C45	CAP ELEC .47UF 50V 20% SUB MIN	26421-104C
C46	CAP CER .01UF 100V 20% DISC	26383-055L
C47	CAP PETP .1UF 63V 10% RAD MIN	26582-429F
C48	CAP CER .001UF 63V 10% PLATE	26383-585M
C49	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C50	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C51	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C52	CAP CER .01UF 100V 20% DISC	26383-055L
C53	CAP CER .01UF 100V 20% DISC	26383-055L
C54	CAP CER .01UF 100V 20% DISC	26383-055L
C55	CAP CER .01UF 100V 20% DISC	26383-055L
C56	CAP CER .01UF 100V 20% DISC	26383-055L
C57	CAP CER .01UF 100V 20% DISC	26383-055L
C58	CAP PETP .01UF 100V 20% DISC	26383-055L
C59	CAP CER .039UF 50V 20% CHIP	26386-757H
C60	CAP CER .001UF 63V 10% PLATE	26383-585M
C61	CAP CER 2.2PF 63V .5PF PLATE	26343-457R
C62	CAP CER 1.8PF 63V .5PF PLATE	26343-456C
C63	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C64	CAP ELEC 4.7UF 35V 20% SUB MIN	26421-108A
C65	CAP CER 68PF 63V 2% PLATE	26343-475F
C66	CAP CER .001UF 63V 10% PLATE	26383-585M
D1	DIODE SIL 1N4448 75V JUNC	28336-246M
D2	DIODE PIN 5082-3379 50V	28383-997T
D3	DIODE SIL 1N4448 75V JUNC	28336-246M
D4	DIODE PIN 5082-3379 50V	28383-997T
D5	DIODE SIL BA482 35V JUNC	28335-675R
D6	DIODE SIL 1N4448 75V JUNC	28336-246M
D7	DIODE SIL 1N4448 75V JUNC	28336-246M
D8	DIODE SIL 1N4448 75V JUNC	28336-246M
D9	DIODE SIL 1N4448 75V JUNC	28336-246M
D10	DIODE SIL 1N4448 75V JUNC	28336-246M

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
D11-13) D16,D17)	DIODE HOT CARR HP 5082-2826 (matched set)	44529-105P
D14	DIODE SIL 1N4448 75V JUNC	28336-246M
D15	DIODE SIL 1N4448 75V JUNC	28336-246M
D18	DIODE PIN 5082-3379 50V	28383-997T
D19	DIODE PIN 5082-3379 50V	28383-997T
D20	DIODE SIL 1N4448 75V JUNC	28336-246M
IC1	ICA AMP TL074CN QUAD FET I/P	28461-349H
IC2	ICD FFD 74LS175 QUAD + EDG TR	28462-614E
IC3	ICA AMP TL074CN QUAD FET I/P	28461-349H
IC4	ICA DAC AD7524JN 8 BIT !	28469-400R
IC5	ICD INV 74LS04 HEX	28469-171L
IC6	ICA DAC AD7522LN 10 BIT MOS!	28469-402K
L1	RES. LEAD LENGTH	
L2	PRINTED COIL	
L3	RES. LEAD LENGTH	
L4	PRINTED COIL	
L5	RES LEAD LENGTH	
L6	IND CHOKE 1.5 TURNS 2.4UH	23642-908P
L7	PRINTED COIL	
L8	IND CHOKE 33UH 10%	23642-558W
L9	IND CHOKE 1.5 TURNS	23642-908P
L10	IND CHOKE 1.5 TURNS	23642-908P
PLCS	CONN ASSY	43129-668H
PLCZ	CON PART PCB POST SQUARE PIN	23435-188V
PLDA	CON PART PCB POST SQUARE PIN	23435-188V
R1	RES MF 750R $\frac{1}{4}$ W 2%	24773-270R
R2	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R3	RES MF 620R $\frac{1}{4}$ W 2%	24773-268B
R4	RES MF 2K7 $\frac{1}{4}$ W 2%	24773-283L
R5	RES MF 33R $\frac{1}{4}$ W 2%	24773-237K
R6	RES MF 240R $\frac{1}{4}$ W 2%	24773-258D
R7	RES CC 200R 1/8W 5%	24331-999A
R8	RES CHIP 16R 5%	24681-043E
R9	RES CHIP 22R 5%	24681-044U
R10	RES MF 750R $\frac{1}{4}$ W 2%	24773-270R
R11	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R12	RES MF 620R $\frac{1}{4}$ W 2%	24773-268B
R13	RES MF 620R $\frac{1}{4}$ W 2%	24773-268B
R14	RES MF 2K7 $\frac{1}{4}$ W 2%	24773-283L
R15	RES MF 33R $\frac{1}{4}$ W 2%	24773-237K

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
R16	RES MF 240R $\frac{1}{4}$ W 2%	24773-258D
R17	RES CC 200R 1/8W 5%	24331-999A
R18	RES CHIP 16R 5%	24681-043E
R19	RES CHIP 22R 5%	24681-044U
R20	RES MF 610R $\frac{1}{4}$ W 2%	24773-268B
R21	RES MF 470R $\frac{1}{4}$ W 2%	24773-265M
R22	RES MF 3K3 $\frac{1}{4}$ W 2%	24773-285F
R23	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R24	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R25	RES MF 150R $\frac{1}{4}$ W 2%	24773-253F
R26	RES CHIP 22R 5%	24681-044U
R27	RES MF 750R $\frac{1}{4}$ W 2%	24773-270R
R28	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R29	RES MF 2K7 $\frac{1}{4}$ W 2%	24773-283L
R30	RES CC 82R 1/8W 5%	24331-996R
R31	RES MF 22R $\frac{1}{4}$ W 2%	24773-233M
R32	RES MO 150R $\frac{1}{2}$ W 2%	24573-053K
R33	RES CHIP 16R 5%	24681-043E
R34	RES CHIP 16R 5%	24681-043E
R35	RES CHIP 16R 5%	24681-043E
R36	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R37	RES MF 15K $\frac{1}{4}$ W 2%	24773-301P
R38	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R39	RES MF 8R2 $\frac{1}{4}$ W 2%	24773-223V
R40	RES CHIP 16R 5%	24681-043E
R41	RES CHIP 16R 5%	24681-043E
R42	RES MF 200R $\frac{1}{4}$ W 2%	24773-256S
R43	RES MG 4M7 $\frac{1}{4}$ W 5%	24321-881F
R44	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R45	RES MG 4M7 $\frac{1}{4}$ W 5%	24321-881F
R46	RES MG 4M7 $\frac{1}{4}$ W 5%	24321-881F
R47	RES MF 50R $\frac{1}{4}$ W 1%	24762-558R
R48	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R49	RES MF 200R $\frac{1}{4}$ W 2%	24773-256S
R50	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R51	RES MF 820R $\frac{1}{2}$ W 2%	24773-271B
R52	RES MF 27R $\frac{1}{4}$ W 2%	24773-235R
R53	RES MF 100K $\frac{1}{4}$ W 2%	24773-321L
R54	RES MF 200R $\frac{1}{4}$ W 2%	24773-256S
R55	RES MF 20K $\frac{1}{4}$ W 2%	24773-304C
R56	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R57	RES MF 100K $\frac{1}{4}$ W 2%	24773-321L
R58	RES MF 560R $\frac{1}{4}$ W 2%	24773-267R
R59	RES MF 27R $\frac{1}{4}$ W 2%	24773-235R
R60	RES MF 100K $\frac{1}{4}$ W 2%	24773-321L

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
R61	RES MF 100K $\frac{1}{4}$ W 2%	24773-321L
R62	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R63	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R64	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R65	RES MF 3K3 $\frac{1}{4}$ W 2%	24773-285F
R66	RES MF 150R $\frac{1}{4}$ W 2%	24773-253F
R67	RES MF 47R $\frac{1}{4}$ W 2%	24773-241A
R68	RES MF 15K $\frac{1}{4}$ W 2%	24773-301P
R69	RES MF 30K $\frac{1}{4}$ W 2%	24773-308A
R70	RES MF 15K $\frac{1}{4}$ W 2%	24773-301P
R71	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R72	RES MF 3K3 $\frac{1}{4}$ W 2%	24773-285F
R73	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R74	RES MF 68K $\frac{1}{4}$ W 2%	24773-317N
R75	RES MF 68K $\frac{1}{4}$ W 2%	24773-317N
R76	RES NET 10K 5% 8 DIL	24681-511P
R77	RV CERM 1K0 LIN $\frac{1}{2}$ W 10%	25711-638G
R78	RES MF 2K0 $\frac{1}{4}$ W 2%	24773-280U
R79	RES MF 15K $\frac{1}{4}$ W 2%	24773-301P
R80	RES MF 2K0 $\frac{1}{4}$ W 2%	24773-280U
R81	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R82	RES MF 1K5 $\frac{1}{4}$ W 2%	24773-277U
R84	RES MF 3K3 $\frac{1}{4}$ W 2%	24773-285F
R85	RES MF 3K3 $\frac{1}{4}$ W 2%	24773-285F
R86	RV CERM 500R LIN $\frac{1}{2}$ W 10%	25711-637F
R87	RES MF 150R $\frac{1}{4}$ W 2%	24773-253F
R89	RV CERM 50K LIN $\frac{1}{2}$ W 10%	25711-643S
R90	RES MF 33K $\frac{1}{4}$ W 2%	24773-209Z
R91	RES MG 3M3 $\frac{1}{4}$ W 5%	24321-879G
R92	RES MG 3M3 $\frac{1}{4}$ W 5%	24321-879G
R93	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R94	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R95	RV CERM 10K LIN $\frac{1}{2}$ W 10%	25711-641G
R96	RES MF 8K2 $\frac{1}{4}$ W 2%	24773-295P
R97	RES MF 2.7K $\frac{1}{4}$ W 2%	24773-283L
R98	RES MF 620R $\frac{1}{4}$ W 2%	24773-268B
R99	RES MF 430R 1/4W 2%	24773-264X
R100	RES MF 2K0 $\frac{1}{4}$ W 2%	24773-280U
R101	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R102	RES MF 10K $\frac{1}{4}$ W 2%	24773-297M
R103	RES MF 560R $\frac{1}{4}$ W 2%	24773-267R
R104	RES MF 1K $\frac{1}{4}$ W 2%	24773-273A
R105	RES MF 100R $\frac{1}{4}$ W 2%	24773-249J

<i>Circuit ref.</i>	<i>Description</i>	<i>Part No.</i>
SKAY	CONN ASSY SKAZ	43129-679G
TR1	TRANS PNP SIL BC308B 20V	28433-455R
TR2	TRANS NPN SIL BFR91A 12V	28451-694H
TR3	TRANS PNP SIL BC308B 20V	28433-455R
TR4	TRANS NPN SIL BFR91A 12V	28451-694H
TR5	TRANS PNP SIL BC308B 20V	28433-455R
TR6	TRANS NPN SIL BC208B 20V	28452-781A
TR7	TRANS PNP SIL BC308B 20V	28433-455R
TR8	TRANS NPN SIL BFR96 S 15V	28452-172N
TR9	TRANS PNP SIL BC308B 20V	28433-455R
TR10	TRANS NPN SIL BFQ34 8V	28452-247V
TR11	TRANS NPN SIL 2N2369 15V	28452-197H
TR12, TR14	TRANS FET J310 24mA 15V (MATCHED PAIR)	44529-114K
TR13	TRANS NPN SIL 2N2369 15V	28452-197H
TR15	TRANS NPN SIL 2N2369 15V	28452-197H
TR16	TRANS PNP SIL BC308B 20V	28433-455R
TR17	TRANS NPN SIL BC 208B 20V	28452-781A
TR18	TRANS PNP SIL BD136 45V	28435-238G
TR19	TRANS NPN SIL BC208B 20V	28452-781A
TR20	TRANS PNP SIL BC308B 20V	28433-455R
X1	FERRITE BEAD	23635-404Y

Chap. 7

Page 2 : Add to the contents list; AC4/2 Output amplifier.
Add the included AC4/2 component layout and circuit diagram
to this chapter.



