

# **audio research**

H I G H D E F I N I T I O N<sup>®</sup>

3900 ANNAPOLIS LANE NORTH / PLYMOUTH, MINNESOTA 55447-5447 / PHONE: 763-577-9700 FAX 763-577-0323

REF2MKII PREAMPLIFIER

SCHEMATIC

BAL GAINLOSS:

-5.9dB  
PAD

+12.2dB  
Q1-4

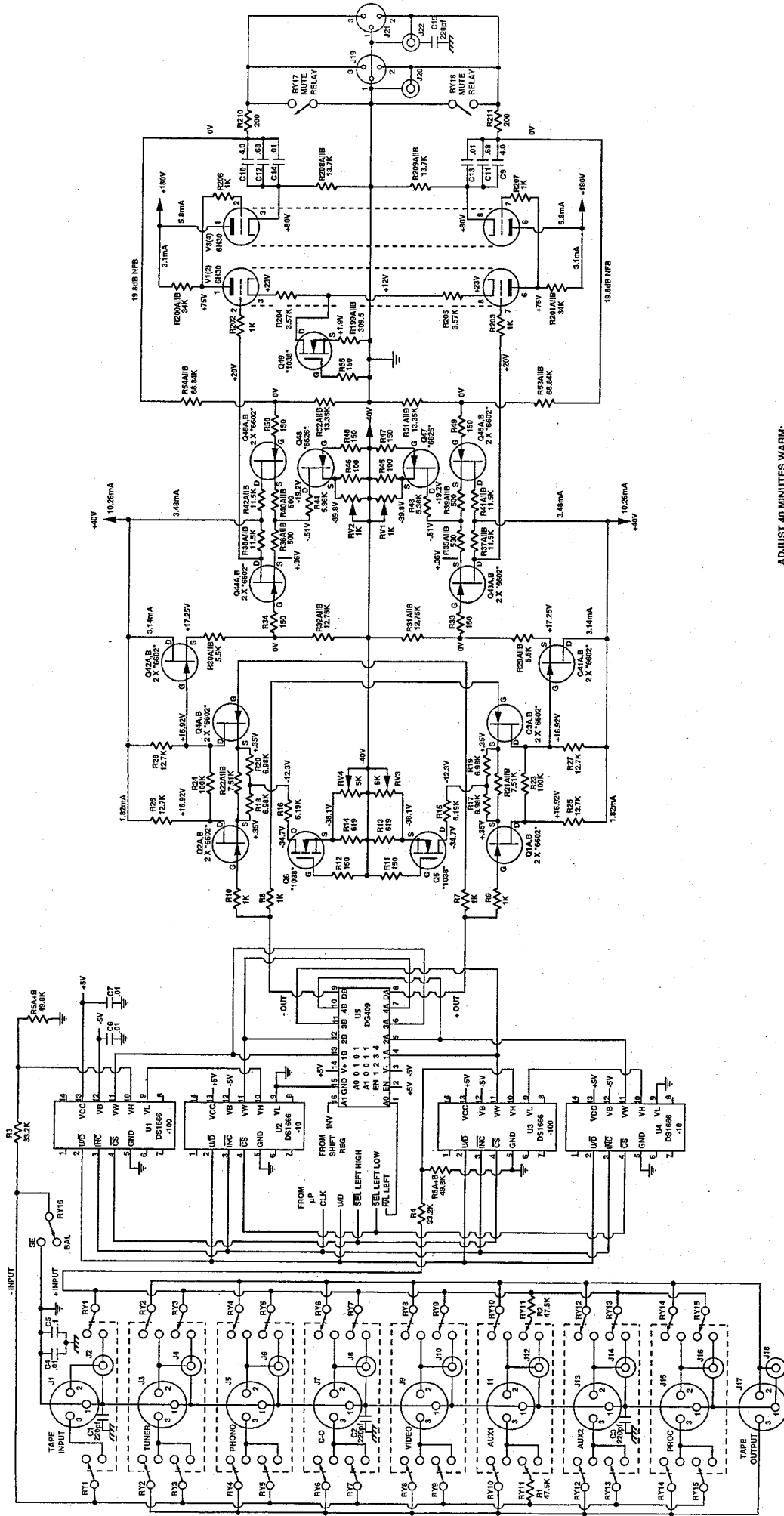
-3.1dB  
Q41-42

+0.8dB  
Q43-46

+14.7dB  
V1

-0.6dB  
V3

+18.1dB  
OVERALL

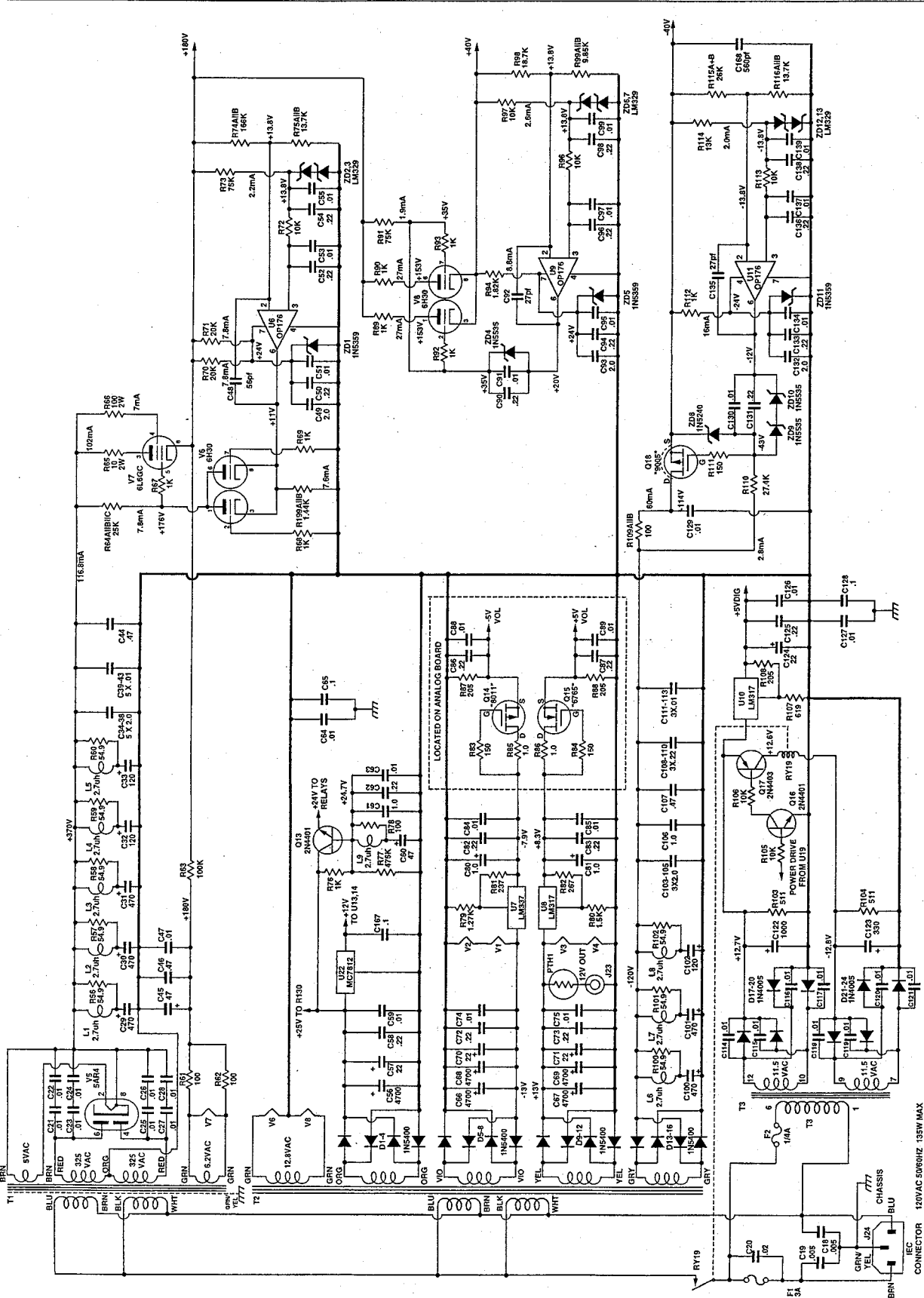


- ADJUST 40 MINUTES WARM:  
 1. RV3.4 FOR 0V R33.34.  
 2. RV1.2 FOR +20V R202.203.

PROPRIETARY NOTICE: THIS DRAWING CONTAINS PATENTED, PATENT APPLIED FOR, AND UNPATENTED INFORMATION OF AUDIO RESEARCH CORPORATION AND IS REPRODUCED FOR CONFIDENTIAL BASIS FOR IDENTIFICATION PURPOSES ONLY.

AUDIO RESEARCH CORPORATION  
 8740 GREEN CIRCLE DRIVE  
 MINNETONKA, MN 55345-4424

REF2 MKII  
 INPUT & AUDIO  
 REV 4  
 PAGE 1 of 3  
 5-3-01

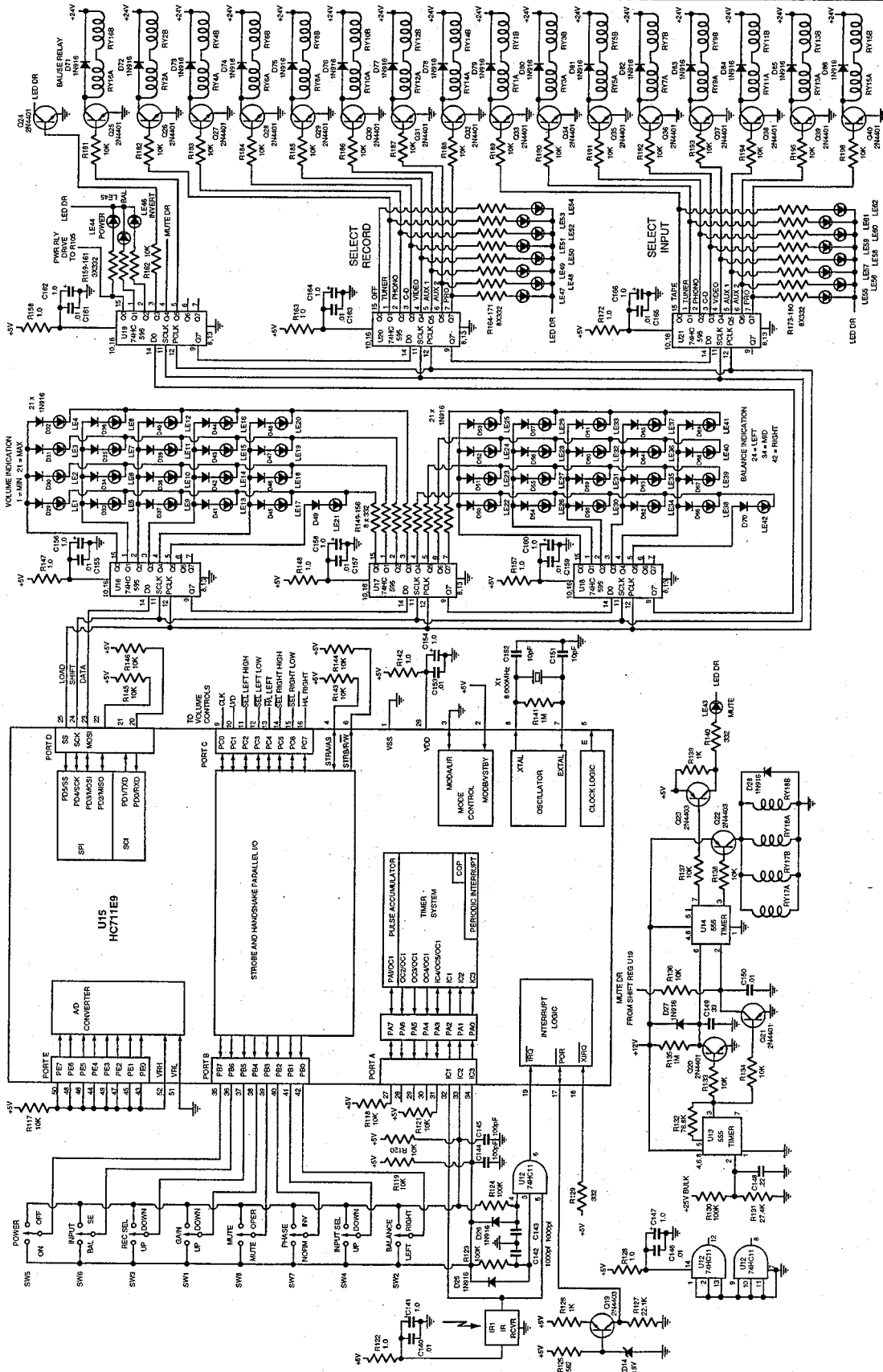


PROPERTY NOTICE: THIS DRAWING CONTAINS PATENT INFORMATION. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE ORIGINAL AUTHOR OR PUBLISHER.

AUDIO RESEARCH CORPORATION  
 1740 GREEN CIRCLE DRIVE  
 MINNEAPOLIS, MN 55424

REF 2 MKII  
 POWER SUPPLY  
 REV 4  
 PAGE 2 of 3  
 5-7-01

IEC CONNECTOR 120VAC 50/60HZ 155W MAX



PROPRIETARY NOTICE: THIS DRAWING CONTAINS PATENTED, PATENT APPLIED FOR, AND/OR OTHER COPYRIGHTED PROPRIETARY INFORMATION OF AUDIO RESEARCH CORPORATION. IT IS UNLAWFUL TO REPRODUCE OR TRANSMIT THIS INFORMATION ON ANY MEDIUM WITHOUT THE WRITTEN CONFIDENTIAL BASIS FOR IDENTIFICATION PURPOSES ONLY.

AUDIO RESEARCH CORPORATION  
5740 GREEN CIRCLE DRIVE  
MINNETONKA, MN 55343-4434

REF2 MKII  
I/P & INTERFACE LOGIC  
REV 4  
PAGE 3 of 3  
5-7-01

**audio research**  
HIGH DEFINITION®

3900 ANNAPOLIS LANE NORTH / PLYMOUTH, MINNESOTA 55447-5447 / PHONE: 763-577-9700 FAX 763-577-0323

REF2MKII PREAMPLIFIER

PARTS LIST

5-8-02

## PARTS LIST

As of MAY 8 02

PRODUCT: REF2MKII

Schematic Symbol	Quantity	ARC Part #	Description
C CAPACITORS			
C1,2,3,15	8	52220200	CAP., 220pf 200V ±10%
C4,6,7,64,114-121,127,140,146,152-154	26	52100400	CAP., .01µf 200V ±10%
C 156,158,160,162,150			
C5,65,128	4	52100500	CAP., 0.1µf 100V ±20%
C9,10	4	53400604	CAP., 4.0µF 20% 425V Mag
C11,12	4	53680507	CAP., .68µF 425V (M2A) INFINI
C13,14	4	53100415	CAP., .013µF 630V (M) INFINI
C18,19	2	53470305	CAP.,.4700pF ±20% 250V or 275V
C20	1	52200400	CAP., .02µF 300VAC/2000VD 20%
C21-28	8	53100407	CAP., .01µf ±20% 250V
C29,30,31	3	50470807	CAP., 470µF 450V "LYTIC"
C32,33,102	3	50120801	CAP., 120µF 450V "LYTIC"
C34-38	5	53200602	CAP., 2µF ±10% 450V
C39-43,111-113,129	9	53100412	CAP., .01µF ±10% 600V RTX
C44	1	53470509	CAP., .47µf ±10% 450V
C45	1	50470703	CAP., 47µF 250V
C46,107	2	53470511	CAP., .47µf ±20% 250V
C47,51,53,55,59,63,74-75,84-85,88-89	19	53100410	CAP., .01uf ±10% 400V
C 91,95,97,99,126,130,134			
C48	1	53560103	CAP., 56pf ± 2.5% 630V PPN
C49,93,103,104,105,132	6	53200603	CAP., 2µF ±10% 250V
C50,52,54,58,62,72-73,82-83,86-87,90	19	53220507	CAP., .22µf ±10% 160V
C 94,96,98,108-110,125			
C56,66,67,68,69	5	50470901	CAP., 4700µF 35V
C57,70,71,124	4	50220702	CAP., 22µF 50V "LYTIC"
C60	1	50470701	CAP., 47µF 35V ±20%
C61,106	2	53100606	CAP., 1.0µf ±10% 250V
C80,81,141,147,154,156,158,160,162	11	50100601	CAP., 1µF 50V "LYTIC"
C 164,166			
C92,135	2	53270101	CAP., 27pf ±1pf 630V PNP
C100,101	2	50470809	CAP., 470µF 250V
C122	1	50100913	CAP., 1000µF 16V "LYTIC"
C123	1	50330801	CAP., 330µF 16V "LYTIC"
C131,133,136,138,148	5	53220507	CAP., .22µf ±10% 160V
C137,139	2	53100410	CAP., .01uf ±10% 400V
C142,143	2	52100301	CAP., 1000pf 200V ±10% CER RAD
C144,145	2	52100200	CAP., 100pf 200V ±10%
C149	1	51330702	CAP., 33µf 16V ±10%
C151,152	2	52100100	CAP., 10pf 200V ±10% CER. RAD.
C168	1	53560201	CAP., 560pF ±2.5% 630V
D DIODES			
D1-16	16	30501500	1N5400
D17-24	8	30500400	1N4005
D25-86	61	30500910	1N916B

## PARTS LIST

As of MAY 8 02

PRODUCT: REF2MKII

Schematic Symbol	Quantity	ARC Part #	Description
F			FUSES
F1	1	34500404	(B)FUSE, 3 AMP MDQ BUSSMAN
F2	1	34500102	(B)FUSE, 1/4 AMP 250V
IR			IR RECEIVERS
IR1	1	34100400	RECEIVER, IR VISHAY TSOP1736
J			CONNECTORS
J1,3,5,7,9,11,13,15	16	23201960	CONNECTOR, XLR FEM. #NC3FD-V-B
J2,4,6,8,10,12,14,16,18,20,22	11	23201509	JACK, CHASSIS RED
J2,4,6,8,10,12,14,16,18,20,22	11	23201510	JACK, CHASSIS WHITE
J17,19,21	6	23201965	CONNECTOR, XLR MALE #NC3MD-V-B
J23	1	23202900	JACK, MINI PHONE .140"
J24	1	23201800	INLET, IEC MALE POWER
L			INDUCTORS
L1-9	9	61000160	CHOKE, 2.7 $\mu$ H $\pm$ 10%
LE			PANEL INDICATOR
LE1-62	62	34300300	L.E.D., GREEN SPOT LTL-1234A
PTH			POSISTERS
PTH1	1	47000700	SWITCH, POLYSWITCH LS25
Q			TRANSISTORS
Q1A/B/C-4A/B/C,41A/B/C-46A/B/C	60	30006503	FET, WHITE ORANGE
Q5,6,49	6	30011016	(SS)FET, GREEN/WHITE/BLUE
Q13,16,20,21,24-40	21	30002800	TRANSISTOR, 2N4401
Q14	1	30008011	FET, GREEN GREEN
Q15	1	30006765	FET, ORANGE-YELLOW-GREEN
Q17,19,22,23	4	30002900	TRANSISTOR, 2N4403
Q18	1	30009005	FET, GREEN-GRAY
Q47,48	4	30006626	FET, VIOLET RED BLUE
R			RESISTORS
R1,2	4	42475402	RES., 47.5K $\Omega$ MK-2 1% 50 PPM
R3,4	4	49332413	RES., 33.2K CADDOCK
R5A,5B,6A,6B	8	49249413	RES., 24.9K CADDOCK
R7-10,35A,B,36A,B,39A,B,40A,B,67-69	30	42100303	RES., 1K $\Omega$ MK-3 1% 50PPM
R 76,92,93			
R11,12,33,34,47-50,55,83,84,111	21	42150202	RES., 150 $\Omega$ MK-2 1% 50PPM
R13A,13B,14A,14B	8	42110303	RES., 1.10K $\Omega$ MK3 1% 25PPM
R15,16	4	42619303	RES., 6.19K $\Omega$ MK-3 1% 50 PPM
R17,18,19,20	8	42698303	RES., 6.98K $\Omega$ MK-3 1% PPM
R21A,22A	4	42178403	RES., 17.8K $\Omega$ MK-3 1% 50PPM
R21B,22B,114,115A,115B	7	42130403	RES., 13K $\Omega$ MK-3 1% 50PPM
R23,24,53A,54A	8	42100503	RES., 100K $\Omega$ MK-3 1% 50PPM

## PARTS LIST

As of MAY 8 02

PRODUCT: REF2MKII

Schematic Symbol	Quantity	ARC Part #	Description
R25-28	8	42127403	RES., 12.7K $\Omega$ MK-3 1% 50PPM
R29A,29B,30A,30B	8	42110403	RES., 11K $\Omega$ MK-3 1% 50PPM
R31A,31B,32A,32B	8	42255403	RES., 25.5K $\Omega$ MK-3 1% 50PPM
R37A,38A,41A,42A	8	42221403	RES., 22.1K $\Omega$ MK-3 1% 50PPM
R37B,38B,41B,42B	8	42237403	RES., 23.7K $\Omega$ MK-3 1% 50PPM
R43,44	4	42536303	RES., 5.36K $\Omega$ MK-3 1% 50PPM
R45,46,61,62,78	7	42100203	RES., 100 $\Omega$ MK-3 1% 50PPM
R51A,B,52A,B	8	42267403	RES., 26.7K $\Omega$ MK3 1% 50PPM
R53B,54B	4	42221503	RES., 221K $\Omega$ MK-3 1% 50PPM
R56-60,100-102	8	42549103	RES., 54.9 $\Omega$ MK-3 1% 50PPM
R63	1	42100505	RES., 100K $\Omega$ MK-8 1% 50PPM
R64A,B,C,73,91	5	42750405	RES., 75K $\Omega$ MK-8 1% 50PPM
R65	1	43100105	RES., 10 $\Omega$ 2W 5% W.W.
R66	1	43100208	RES., 100 $\Omega$ 5% 3W W.W.
R70,71,99B	3	42200414	RES., 20K $\Omega$ MK-5 1% 50PPM
R72,96,105,106,113,97	6	42100403	RES., 10K $\Omega$ MK-3 1% 50PPM
R74A,B	2	42332503	RES., 332K $\Omega$ MK-3 1% 50PPM
R75A,B,110,116A,B,131	6	42274403	RES., 27.4K $\Omega$ MK-3 1% 50PPM
R77	1	42475502	RES., 475K $\Omega$ MK-2 1% 50PPM
R79	1	42127303	RES., 1.27K $\Omega$ MK-3 1% 50PPM
R80	1	42150303	RES., 1.50K $\Omega$ MK-3 1% 50PPM
R81	1	42237203	RES., 237 $\Omega$ MK-3 1% 50PPM
R82	1	42267203	RES., 267 $\Omega$ MK-3 1% 50PPM
R85,86	2	43100006	RES., 1.0 $\Omega$ 3W PRC
R87,88,108	3	42205203	RES., 205 $\Omega$ MK-3 1% 50PPM
R94	1	42182303	RES., 1.82K $\Omega$ MK-3 1% 50PPM
R98	1	42187402	RES., 18.7K $\Omega$ MK2 1% 50PPM
R99A	1	42196403	RES., 19.6K $\Omega$ MK-3 1% 50PPM
R103,104	2	42511203	RES., 511 $\Omega$ MK-3 1% 50PPM
R107,199B	3	42619203	RES., 619 $\Omega$ MK-3 1% 50PPM
R109A,109B,210,211	6	42200205	RES., 200 $\Omega$ MK8 1% 50PPM
R117-121,133,134,136-138,143-146,181-196	32	42100402	RES., 10K $\Omega$ MK-2 1% 50 PPM
R 162			
R122,128,142,155,157,159,161,163,165	10	42100002	RES., 1 $\Omega$ MK-2 1% 50 PPM
R123,124,130	3	42100502	RES., 100K $\Omega$ MK-2 1% 50PPM
R125	1	42562202	RES., 562 $\Omega$ MK-2 1% 50 PPM
R126,139	3	42100302	RES., 1K $\Omega$ MK-2 1% 50 PPM
R127	1	42221402	RES., 22.1K $\Omega$ MK-2 1% 50 PPM
R129,140,149-156,159-161,164-171,173-18	29	42332202	RES., 332 $\Omega$ MK-2 1% 50PPM
R132	1	42768403	RES., 76.8K $\Omega$ MK-3 1% 50PPM
R135,141	2	42100602	RES., 1 MEG MK2 1% 50PPM
R200A,200B,201A,201B	8	42681405	RES., 68.1K $\Omega$ MK-8 1% 50PPM
R202,203,206,207,89,90,112	11	42100314	RES., 1K $\Omega$ MK-5 1% 50PPM
R204,205	4	42357303	RES., 3.57K $\Omega$ MK3 1% 50PPM
R208A,208B,209A,209B	8	42274405	RES., 27.4K $\Omega$ MK-8 1% 50PPM
RV CONTROLS			
RV1-3	4	45100302	POT., TRIM 1K $\Omega$ #POT2103P-1-102



## PARTS LIST

As of MAY 8 02

PRODUCT: REF2MKII

Schematic Symbol	Quantity	ARC Part #	Description
RY RELAYS			
RY1-16	32	64101600	RELAY, 12VDC
RY17,18	4	64101000	RELAY, 12V REED S1P 1200Ω
RY19	1	64101200	RELAY, 24V POWER ON
SW SWITCHES			
SW1-4	4	24003300	SWITCH, UP-DOWN REF1-2
SW5-8	4	24102600	SWITCH, MOMENTARY REF1/2/LS25
T TRANSFORMERS			
T1	1	60018014	XFR., HV REF2MKII DUAL V.
T2	1	60017514	XFR., LV REF2MKII DUAL V.
T3	1	60009414	XFR., 5 VOLT DUAL
U INTEGRATED CIRCUITS			
U1,3	4	31008101	POT.,DIG. 100KΩ DS1666-100
U2,4	4	31008111	POT., DIGITAL 10KΩ DS1666-10
U5	2	31003820	DUAL ANALOG SWITCH DG409DJ
U6,9,11	3	31002210	OP-AMP, OP176GP
U7	1	31004700	REGULATOR, VOLTAGE ADJ. NEG.
U8,10	2	31004000	REGULATOR, VOLTAGE ADJ POS.
U12	1	31007400	TRIPLE 3-INPUT & GATE, 74HC11N
U13,14	2	31000800	TIMER, NE555N
U15	1	31006900	(Q)MICROCONTROLLER
U16-21	6	31006800	REGISTER, LATCH
V VACUUM TUBES			
V1-4,6,8	6	32002301	(B)TUBE, 6H30P (TESTED)
V5	1	32001800	(B)TUBE, 5AR4-C
V7	1	32000431	(B)TUBE, 6L6EH TESTED
X CRYSTALS			
X1	1	27000060	CRYSTAL, 8MHZ #CTX082ND
ZD ZENER DIODES			
ZD1,5,11	3	30503500	IN5359A OR B
ZD2,3,6,7,12,13	6	31000705	FET, GREEN
ZD4,9,10	3	30504210	DIODE, ZENER IN5535A (KNOX)
ZD8	1	30504400	IN5240B
ZD14	1	30505300	ZENER, 3.9V BZX79-C3V9RL