

REVISIONS			
REV	DESCRIPTION	REVISED BY	DATE

STAGES 1 THRU 16															
RESISTORS															
R1	15	29	43	57	71	85	99	113	127	141	155	169	183	197	211
R2	16	30	44	58	72	86	100	114	128	142	156	170	184	198	212
R3	17	31	45	59	73	87	101	115	129	143	157	171	185	199	213
R4	18	32	46	60	74	88	102	116	130	144	158	172	186	200	214
R5	19	33	47	61	75	89	103	117	131	145	159	173	187	201	215
R6	20	34	48	62	76	90	104	118	132	146	160	174	188	202	216
R7	21	35	49	63	77	91	105	119	133	147	161	175	189	203	217
R8	22	36	50	64	78	92	106	120	134	148	162	176	190	204	218
R9	23	37	51	65	79	93	107	121	135	149	163	177	191	205	219
R10	24	38	52	66	80	94	108	122	136	150	164	178	192	206	220
R11	25	39	53	67	81	95	109	123	137	151	165	179	193	207	221
R12	26	40	54	68	82	96	110	124	138	152	166	180	194	208	222
R13	27	41	55	69	83	97	111	125	139	153	167	181	195	209	223
R14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224

TRANSISTORS															
Q1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61
Q2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62
Q3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63
Q4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64

CAPACITORS															
C1	6	11	16	21	26	31	36	41	46	51	56	61	66	71	76
C2	7	12	17	22	27	32	37	42	47	52	57	62	67	72	77
C3	8	13	18	23	28	33	38	43	48	53	58	63	68	73	78
C4	9	14	19	24	29	34	39	44	49	54	59	64	69	74	79
C5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

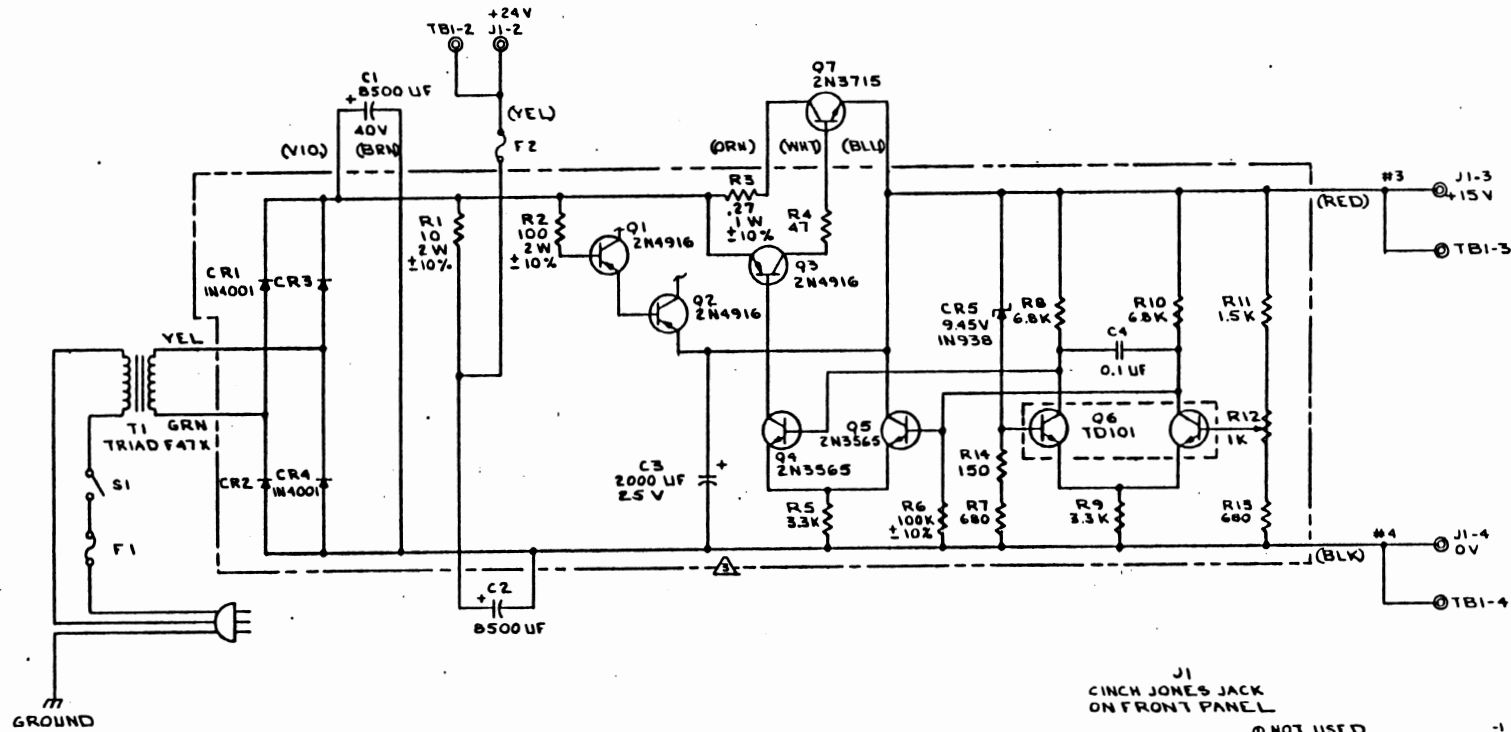
DIODES															
D1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46
D2	5	8	11	14	17	20	23	26	29	32	35	38	41	44	47
D3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48

- ▲ COMPONENTS ARE MOUNTED ON FRONT PANEL.
 7. ALL JACKS ARE MOUNTED ON FRONT PANEL.
 ▲ ALL DIODES ARE IN4S7.
 ▲ ALL CAPACITORS ARE IN MICROFARADS.
 ▲ ALL TRANSISTORS ARE 2N3863.
 ▲ ALL RESISTORS ARE IN OHMS 1/10 WATT.
 ▲ THIS STAGE TO BE REPEATED 15 TIMES.
 1. SAMPLES OR FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION.

UNLESS OTHERWISE SPECIFIED		DWG	DAN VIGIL	DATE	11/20/57
TOLERANCES		CHK	<i>[Signature]</i>	APP'D	<i>[Signature]</i>
FRACIONS	±1/2%	REV	1	DWG TITLE	SCHMATIC TOUCH CONTROLLED VOLTAGE SOURCE NO. 112
JOB	±1%	REV	1	REL. NO.	D 140319
ASSEMBLY	±2%	REV	1	DWG. NO.	140319
FRAC. NOM. INFO.	±1/16"	REV	1	REV	1
HOLE - COMP.	±.002	MATERIAL	11	SCALE	1" = 1"
HOLE - DRILL & REBOR.	±.002	PREPARED BY	11	DATE	11/20/57
STRAIGHTEN.	±.002	CHK'D BY	11	REV	1
HEAT ASSY. NO.	UNED CH	DO NOT SCALE DRAWING	11	SCALE	1" = 1"

SCHEMATIC TOUCH CONTROLLED VOLTAGE SOURCE NO. 112

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED



J1
CINCH JONES JACK
ON FRONT PANEL

+24V 1
GND -1

TBI

NOT USED
 YELLOW
 RED
 BLACK

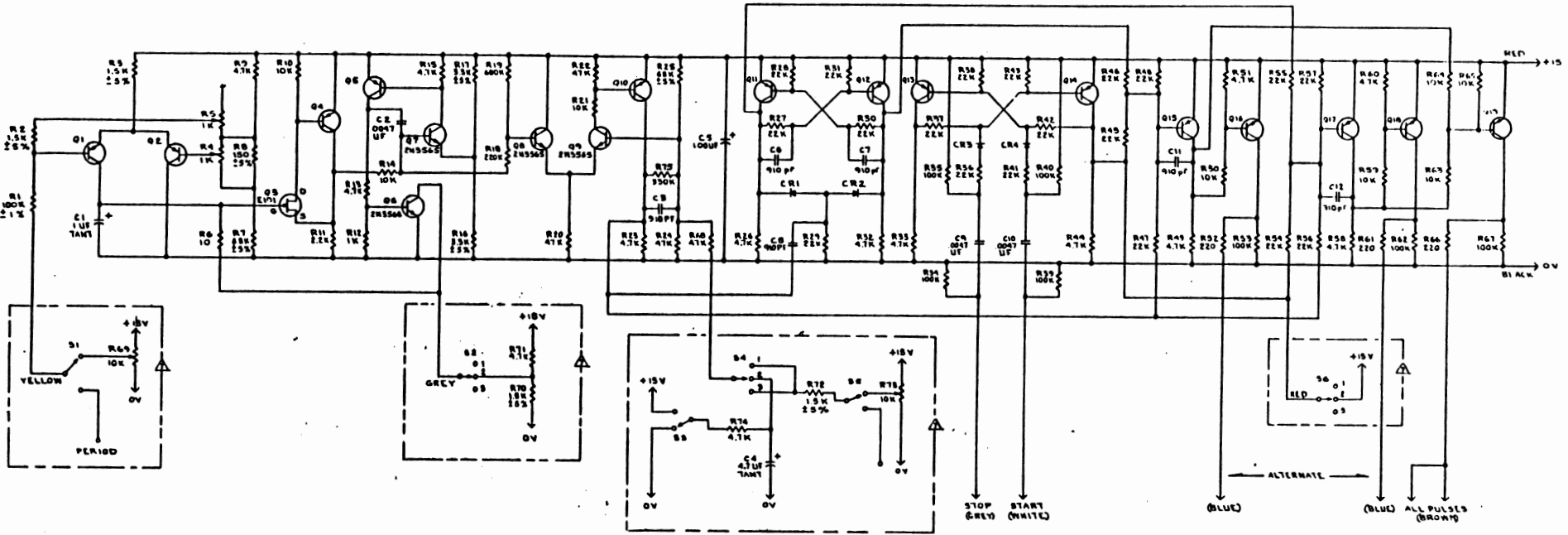
TBI
-1 -2 -3 -4

YEL-RED-BLK

⚠ ALL COMPONENTS MOUNTED ON P.C. BOARD, ALL OTHERS ARE MOUNTED ON FRONT PANEL
2. LAST REFERENCE DESIGNATION USED C 4, CR6, Q7, (R14 OUT OF SEQUENCE)
1 ALL METAL FILM RESISTORS ARE IN OHMS ± 5%, 1/4 W
NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		OWN	DATE	REV
REACTIONS	01/28	CHK	7/7	1
DESIGN	01/28	APPD	7/7	1
ASSEMBLY	01/28	APPD	7/7	1
REVISIONS	01/28	APPD	7/7	1
WELDING	01/28	APPD	7/7	1
DRILLING	01/28	APPD	7/7	1
FINISH	01/28	APPD	7/7	1
COLOUR	01/28	APPD	7/7	1

CBS		MUSICAL INSTRUMENTS PALMISTON, CALIFORNIA	
DRAWING TITLE: SCHEMATIC			
POWER SUPPLY- # 115			
REV. NO.	REV. DATE	REV.	REV.
D	139741	-	-
SCALE		INCHES SYMBOL SIZE #110 SHEET 1 OF 1	

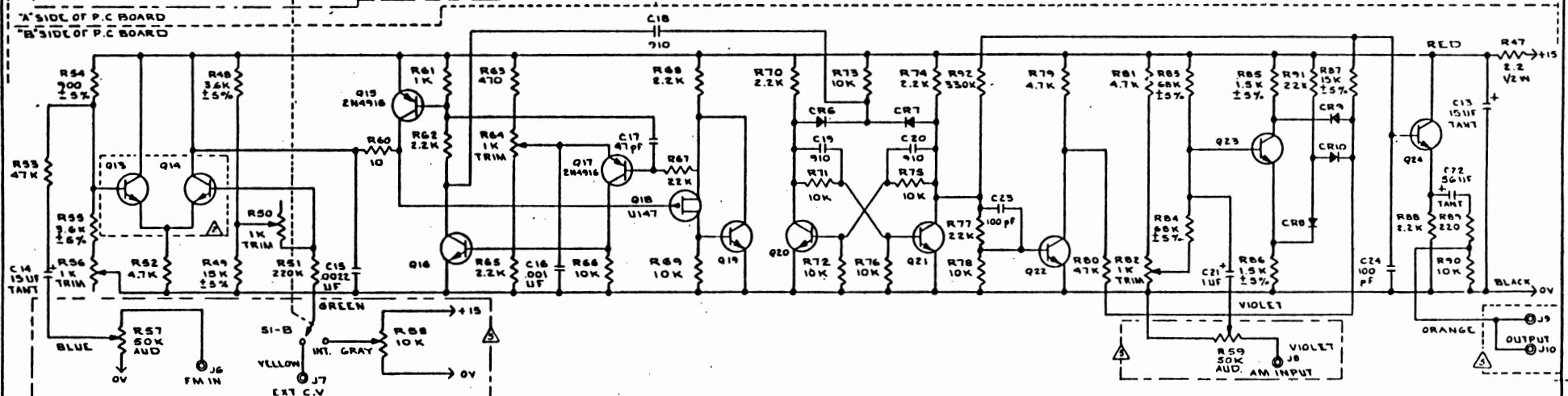
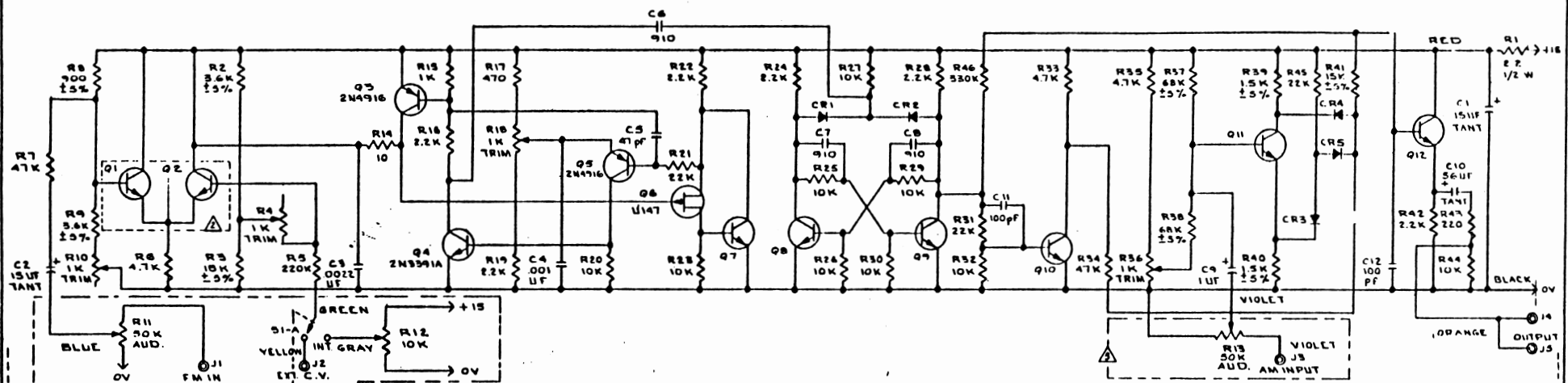


(R) P.C. BOARD CBS P/N 133707 ASSY NO. 137828
 Δ COMPONENTS MOUNTED ON FRONT PANEL
 ALL COMPONENTS ARE MOUNTED ON P.C. BOARD EXCEPT AS NOTED
 S SWITCH POSITIONS 1-4 THROUGH 5-10
 1- START, STOP
 2- SINGLE PULSE, 3- REPETITIVE
 4- LAST REFERENCE DESIGNATION C12, C84, Q19, S8 (R&S, OUT OF SEQUENCE)
 5- DIODES Q1 THRU Q4 ARE 1N457 (D6666)
 6- TRANSISTORS Q1, Q2, Q4, Q5, Q10 THRU Q16 ARE 2N4416
 7- RESISTORS IN OHMS 10K, 1/4 W
 NOTES: UNLESS OTHERWISE SPECIFIED

DESIGN CHANGES BY DATE		C/S		C/S	
NO.	REVISION	BY	DATE	BY	DATE
1					
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CBS FEDERAL INSTRUMENTS
 AND ELECTRONICS CORPORATION
 SCHEMATIC
 TIMING PULSE GENERATOR
 W 140
 139915
 1 OF 1

REVISIONS			
REV	DESCRIPTION	REV'D BY	DATE APPROVED



LAST REFERENCE DESIGNATIONS USED ARE J7, C24, R92, CR10, Q24 & S1B (R1, R6 THRU R13, R45, R46, R47, R52 THRU R59, R91 & R92 ARE OUT OF SEQUENCE)
 COMPONENTS MOUNTED ON FRONT PANEL
 COMPONENTS MOUNTED ON P.C. BOARD EXCEPT AS NOTED
 ALL DIODES ARE FDIII
 TRANSISTORS Q1, Q2, Q13 & Q14 ARE DUAL INTERSIL ITC 122
 RESISTORS IN OHMS ±10%, 1/4 WATT
 NOTES: UNLESS OTHERWISE SPECIFIED

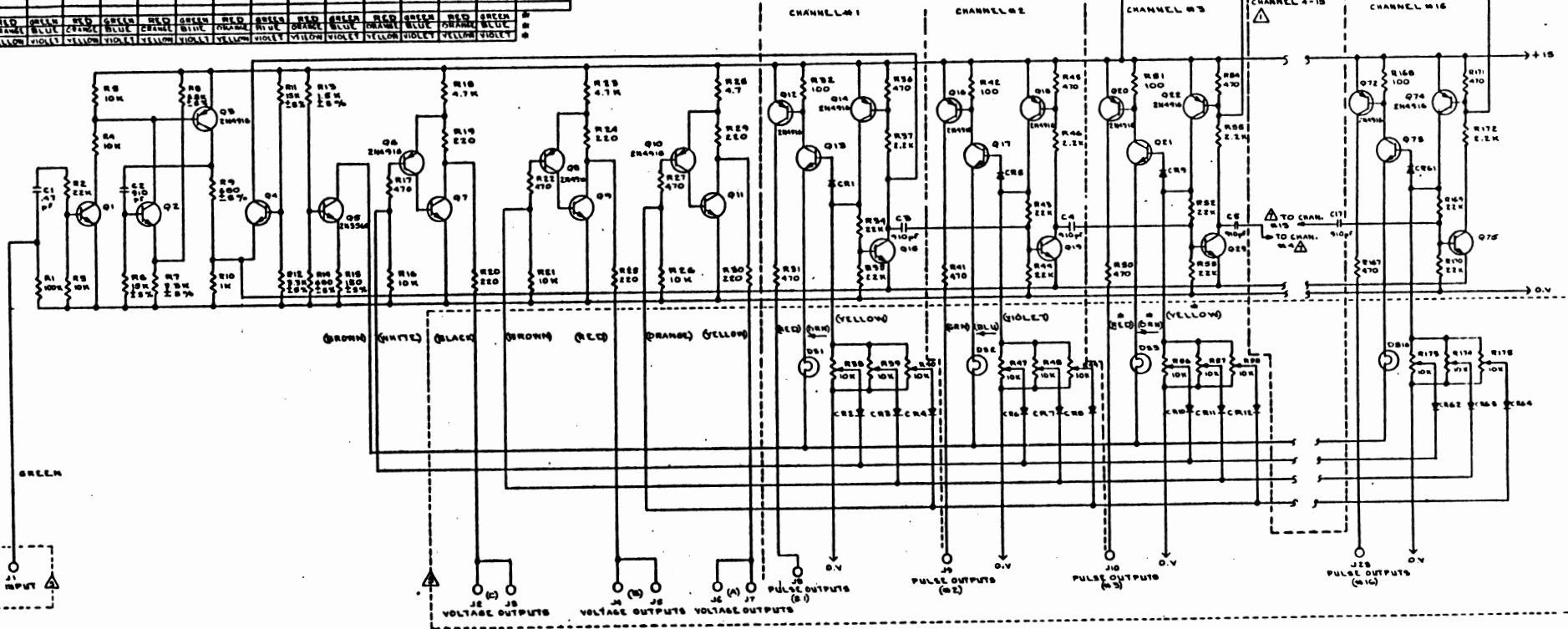
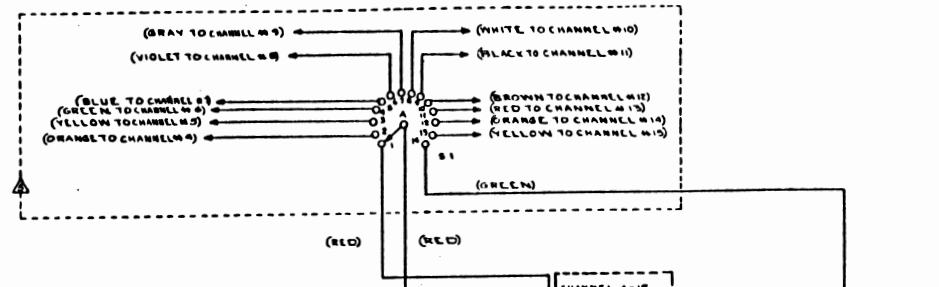
7. TRANSISTORS ARE 2N5565 (EXCEPT AS NOTED)

UNLESS OTHERWISE SPECIFIED		TOLERANCES		DIMENSIONS	
FRACTIONS	1/100				
DECIMALS	0.010				
ANGLES	1°				
DIAMETERS	0.005				
RADIUSES	0.005				
SPACED ANGLES ARE 10°					
ALL DIMENSIONS ARE IN INCHES					
DO NOT SCALE DRAWINGS					

DESIGNED BY	G. K. ...	DATE	10/27/70
CHECKED BY	M. ...	DATE	10/28/70
APPROVED BY	J. ...	DATE	11/1/70
MATERIAL			

CBS MUSICAL INSTRUMENTS FALTON, CALIFORNIA	
DWG. TITLE DUAL SQUARE WAVE OSCILLATOR #144	
REL. NO.	DWG. NO.
D	140160
SCALE	AS SHOWN
SHEET 1 OF 1	

CHAN. #3	CHAN. #4	CHAN. #5	CHAN. #6	CHAN. #7	CHAN. #8	CHAN. #9	CHAN. #10	CHAN. #11	CHAN. #12	CHAN. #13	CHAN. #14	CHAN. #15	CHAN. #16	CHAN. #17	PART TYPE
CR4	CR5	CR6	CR7	CR8	CR9	CR10	CR11	CR12	CR13	CR14	CR15	CR16	CR17	CR18	
CR19	CR20	CR21	CR22	CR23	CR24	CR25	CR26	CR27	CR28	CR29	CR30	CR31	CR32	CR33	
CR34	CR35	CR36	CR37	CR38	CR39	CR40	CR41	CR42	CR43	CR44	CR45	CR46	CR47	CR48	
CR49	CR50	CR51	CR52	CR53	CR54	CR55	CR56	CR57	CR58	CR59	CR60	CR61	CR62	CR63	
CR64	CR65	CR66	CR67	CR68	CR69	CR70	CR71	CR72	CR73	CR74	CR75	CR76	CR77	CR78	
CR79	CR80	CR81	CR82	CR83	CR84	CR85	CR86	CR87	CR88	CR89	CR90	CR91	CR92	CR93	
CR94	CR95	CR96	CR97	CR98	CR99	CR100	CR101	CR102	CR103	CR104	CR105	CR106	CR107	CR108	
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CR154	CR155	CR156	CR157	CR158	CR159	CR160	CR161	CR162	CR163	CR164	CR165	CR166	CR167	CR168	
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CR769	CR770	CR771	CR772	CR773	CR774	CR775	CR776	CR777	CR778	CR779	CR780	CR781	CR782	CR783	
CR784	CR785	CR786	CR787	CR788	CR789	CR790	CR791	CR792	CR793	CR794	CR795	CR796	CR797	CR798	
CR799	CR800	CR801	CR802	CR803	CR804	CR805	CR806	CR807	CR808	CR809	CR810	CR811	CR812	CR813	
CR814	CR815	CR816	CR817	CR818	CR819	CR820	CR821	CR822	CR823	CR824	CR825	CR826	CR827	CR828	
CR829	CR830	CR831	CR832	CR833	CR834	CR835	CR836	CR837	CR838	CR839	CR840	CR841	CR842	CR843	
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CR964	CR965	CR966	CR967	CR968	CR969	CR970	CR971	CR972	CR973	CR974	CR975	CR976	CR977	CR978	
CR979	CR980	CR981	CR982	CR983	CR984	CR985	CR986	CR987	CR988	CR989	CR990	CR991	CR992	CR993	
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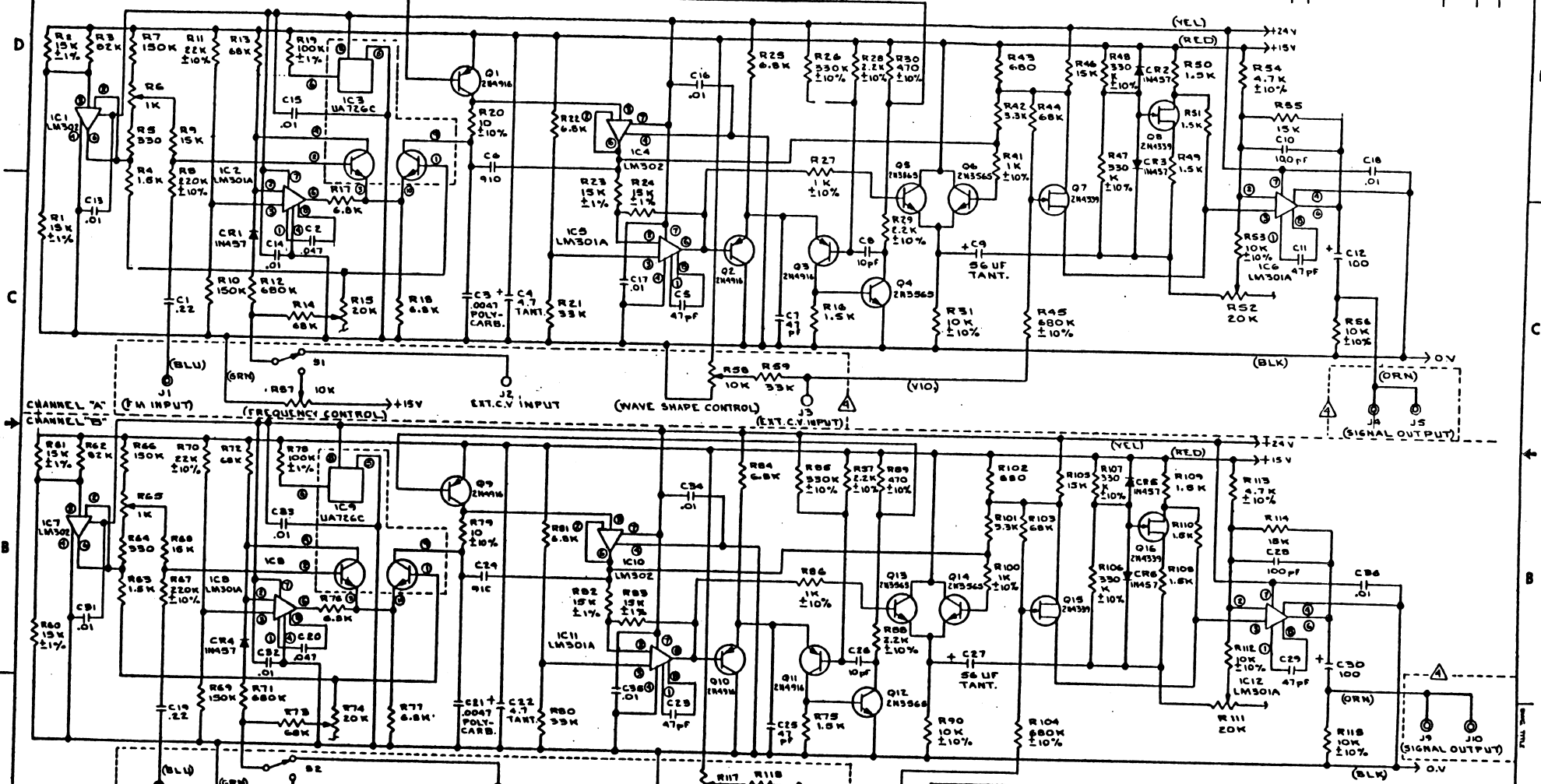


Δ THROUGH ARE IDENTICAL IN CONNECTION TO CHANNELS TO CHANNEL FROM CHANNEL TO CHANNEL & LAST REF. DESIGNATION USED C17, CR64
 * SEE DOWNSIDE PITS & R1 RES OMITTED
 Δ COMPONENTS MOUNTED ON FRONT PANEL
 Δ ALL COMPONENTS MOUNTED ON P.C. BOARD EXCEPT AS NOTED
 * TRANSISTORS ARE 2N3638
 * RESISTORS ARE IN OHMS 1/2 WATT
 Δ CHANNELS 4 THRU 15 ARE IDENTICAL TO CHANNEL #3 EXCEPT FOR REF. DESIGNATIONS (SEE TAB) WIRE COLORS (SEE SWITCH #1 TAB. FOR WIRE CODED WITH AN ASTERISK).
 NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		DATE		REV.	
DESIGNER	DATE	REV.	DATE	REV.	DATE
DRN	11/11/54	1			
CHKD					
APP'D					
TESTED					
WELD					
PROB					
UNLESS OTHERWISE SPECIFIED					
DO NOT SCALE DRAWING					

CBS COMMUNICATIONS BROADCAST SYSTEMS
 SCHEDULE
 SEQUENTIAL VOLTAGE SOURCE W146
 REV. NO. E 140476
 DATE 11/11/54

REVISIONS			
NO.	DESCRIPTION	BY	DATE



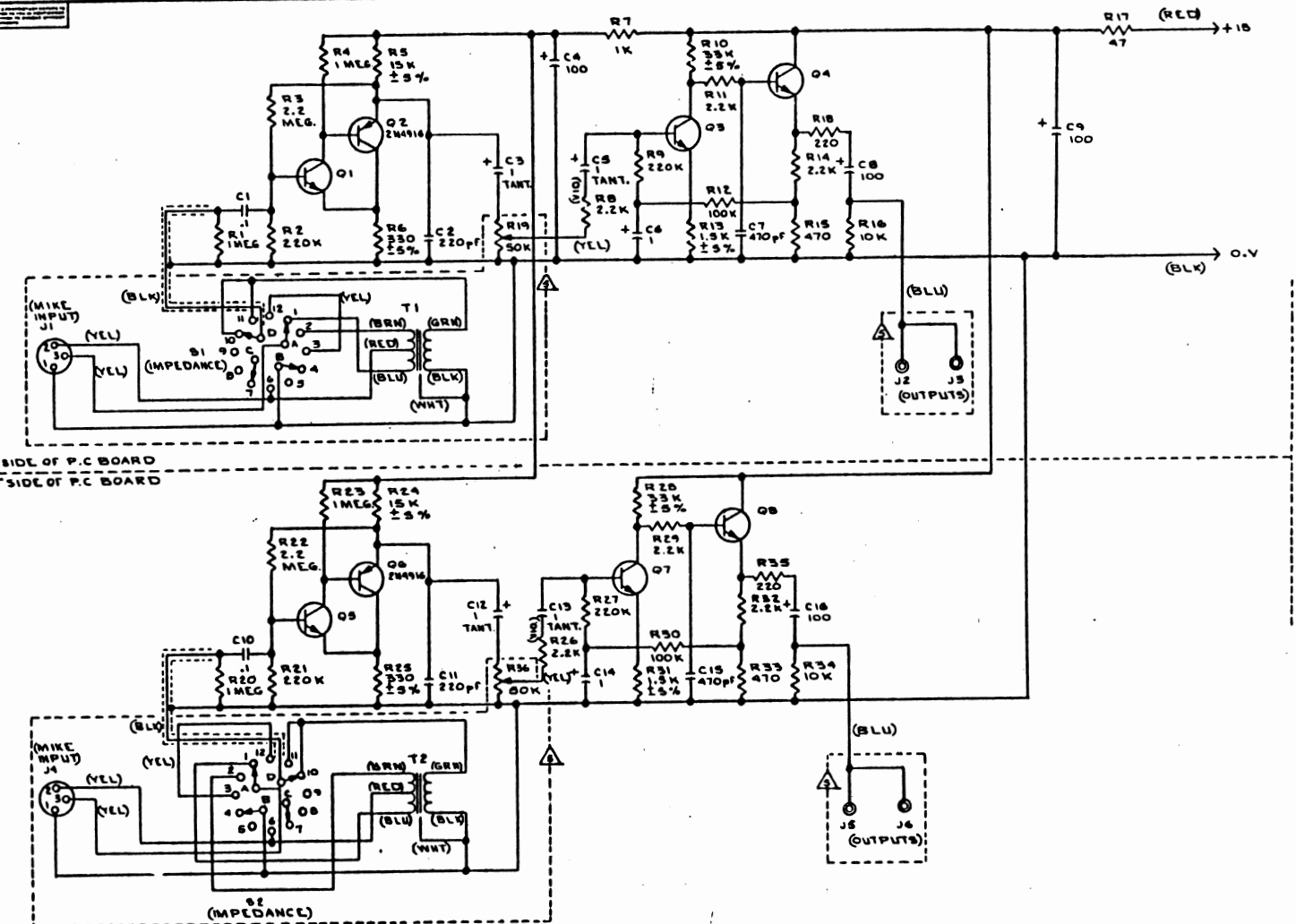
1. COMPONENTS MOUNTED ON FRONT PANEL
 2. CAPACITORS IN MICROFARADS
 3. RESISTORS IN OHMS ± 5%, 1/4 WATT
 4. SAMPLES OF FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STRATTON PRODUCTION
 NOTES, UNLESS OTHERWISE SPECIFIED

4. Q7, Q15 SELECTED 100Ω .770 1.2MACBS P/N 136085
 08, Q16 SELECTED 100Ω .570 .8MACBS P/N 136093
 5. LAST REF. DESIGNATION USED C36, C38, IC12, J10, J2
 Q16 & R19, R16, R78, C5, C23, C13, C18 & C31 - C36, R57 - R59
 R16 - R18 OUT OF SEQUENCE

UNLESS OTHERWISE SPECIFIED	
FRACCTIONS	±1/100
TOLERANCES	±1/10
J1	OK
J2	OK
J3	OK
J4	OK
J5	OK
J6	OK
J7	OK
J8	OK
J9	OK
J10	OK
J11	OK
J12	OK
J13	OK
J14	OK
J15	OK
J16	OK
J17	OK
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J90	OK
J91	OK
J92	OK
J93	OK
J94	OK
J95	OK
J96	OK
J97	OK
J98	OK
J99	OK
J100	OK

CBS PHYSICAL INSTRUMENTS
 PALM SPRING, CALIFORNIA
 DWM C. LUMA
 OK *[Signature]*
 DATE 1/1/68
 DWG. TITLE **SCHEMATIC**
DUAL SINE-SAWTOOTH OSCILLATOR #15B
 REL. NO. D DWG. NO. 140756
 SCALE 1:1
 SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

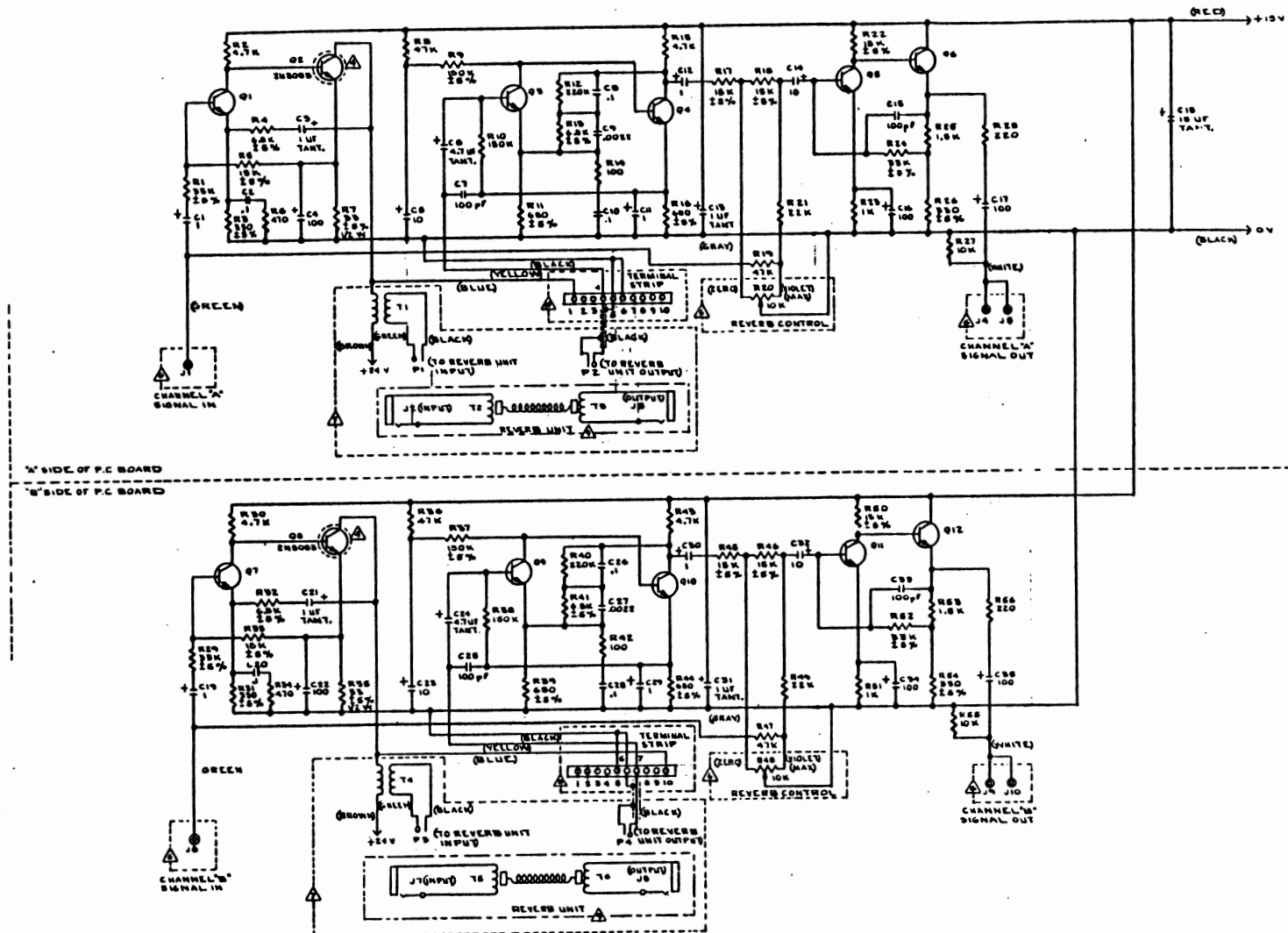


7. LAST REF. DESIGNATION USED C16, J6, Q8, R36 & T2
 (R19 & R36 OUT OF SEQUENCE)
 8. R19 & R36 ARE GAIN ADJUSTMENTS
 9. COMPONENTS MOUNTED ON FRONT PANEL
 1. COMPONENTS MOUNTED ON P.C. BOARD
 2. EXCEPT AS NOTED
 3. CAPACITORS IN MICROFARADS
 4. RESISTORS IN OHMS ± 10% , 1/4 WATT
 5. SAMPLES ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION.

NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		OWN	G. Jones	DATE	11/17/70
TOLERANCES		OK	M. L.	DATE	11/17/70
REVISIONS	1-1/2"	APPROVED			
J2	0.100"	DATE			
J3	0.100"	DATE			
J4	0.100"	DATE			
J5	0.100"	DATE			
FRONT PANEL	0.100"	DATE			
HOUSING	0.100"	DATE			
HOUSING - DIMS & FINISH	0.100"	DATE			
STANDARDS	0.100"	DATE			
UNMARKED ANGLES ARE 90°		MATERIAL			
ALL DIMENSIONS ARE IN INCHES		SCALE			
DO NOT SCALE DRAWING		SCALE			
NEXT ASST NO.	USED ON	SCALE			

CBS		MUSICAL INSTRUMENTS	
		PASADENA, CALIFORNIA	
DWG. TITLE		SCHEMATIC	
		DUAL MICROPHONE	
		PREAMPLIFIER #170	
REL. NO.	SHEET	DWG. NO.	REV.
	D	140616	
SCALE		SHEET 1 OF 1	



A SIDE OF P.C. BOARD
 B SIDE OF P.C. BOARD

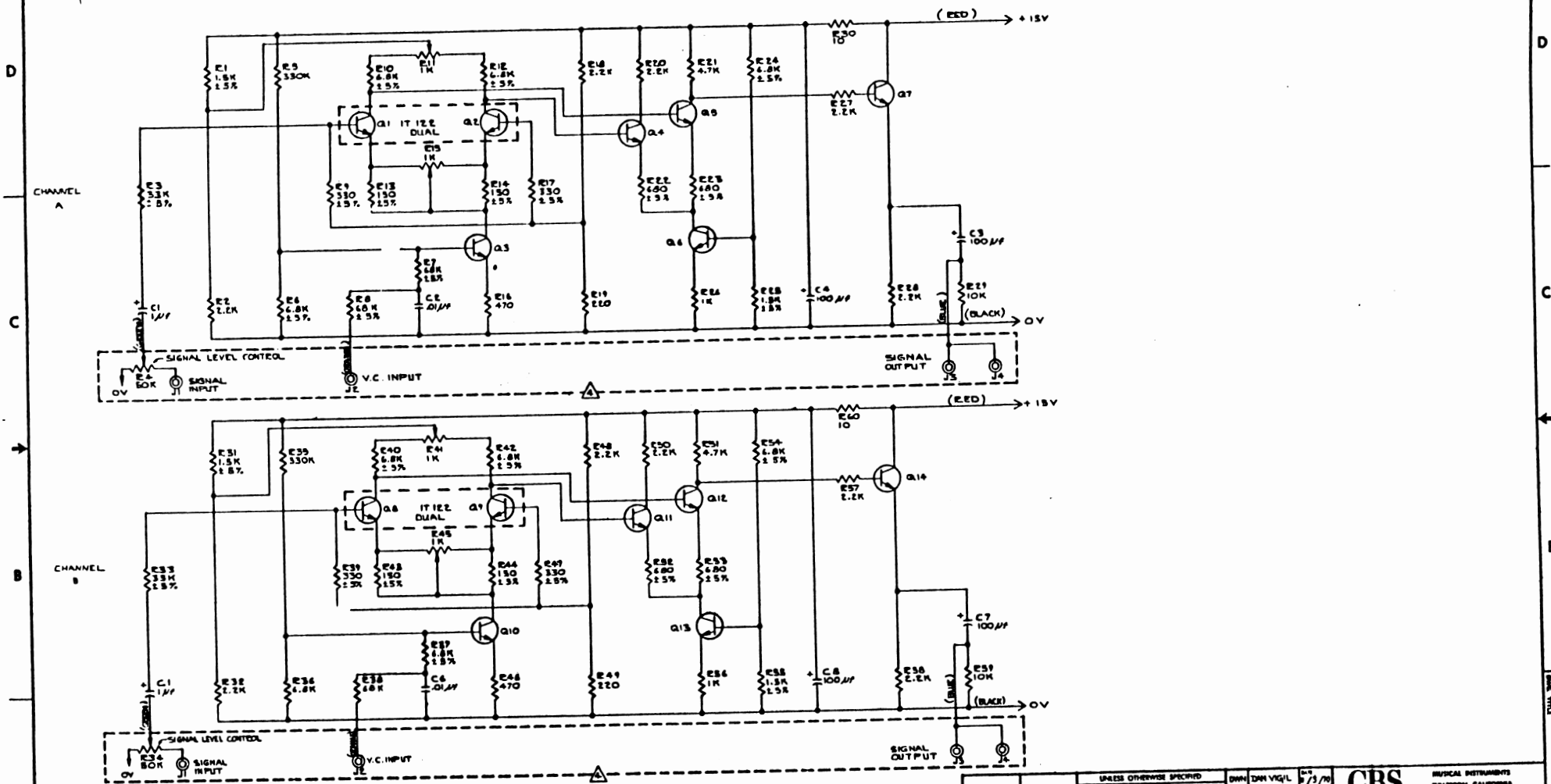
- ▲ TERMINAL STRIP MOUNTED ON BACK OF MODULE
- ▲ (1) REVERSAL UNIT CBS P/N 041005
- ▲ LANT REFERENCE DESIGNATIONS USED ARE CBS J1/Q12, R66 & T6
- ▲ REVERSAL UNIT ASSEMBLY MOUNTED IN CABINET
- ▲ COMPONENTS MOUNTED ON FRONT PANEL (EXCEPT AS NOTED)
- ▲ TRANSISTORS Q1 & Q2 ARE 2N3638 (REF) WITH HEATSINK CAL TOG WAFERFIELD 207 CBS P/N 143075
- ▲ TRANSISTORS ARE 2N3637 (EXCEPT AS NOTED)
- ▲ CAPACITORS ARE IN MICROFARADS
- ▲ RESISTORS IN OHMS 10%, 1/4 W.

NOTES: UNLESS OTHERWISE SPECIFIED

DESIGN CHANGES		DATE	BY	REASON
1	REVISED	1-1965
2	REVISED
3	REVISED
4	REVISED
5	REVISED
6	REVISED
7	REVISED
8	REVISED
9	REVISED
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97	REVISED
98	REVISED
99	REVISED
100	REVISED

CBS ELECTRONIC INDUSTRIES
 SAN DIEGO, CALIFORNIA
DUAL REVERSAL UNIT #190
 140251
 1 OF 1

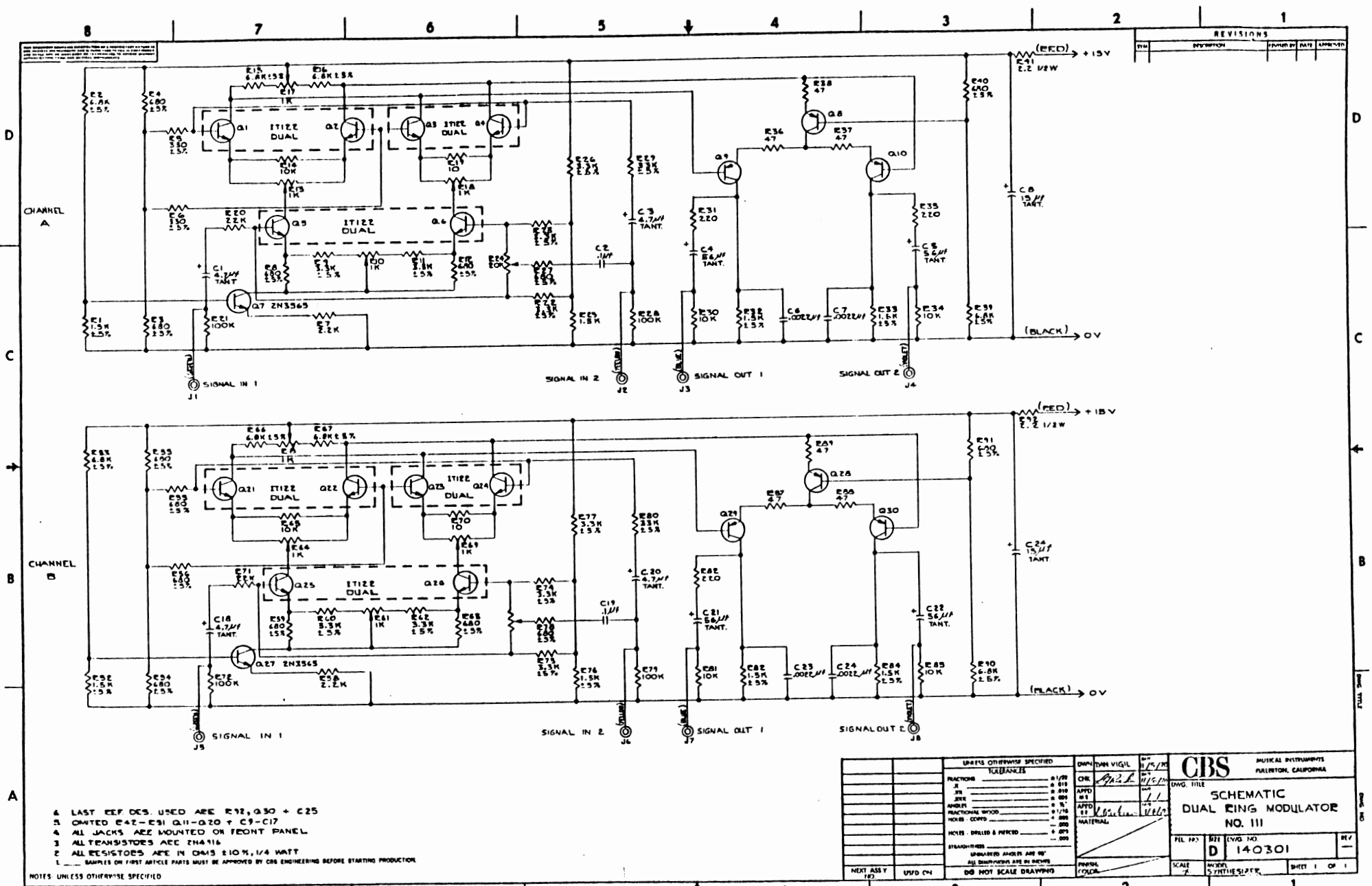
REVISIONS				
REV	DESCRIPTION	REVISED BY	DATE	APPROVED



* LAST REF. DES. USED ARE Q14, R40, C8
 Δ COMPONENTS MOUNTED ON FRONT PANEL
 † ALL TRANSISTOR ARE 2N3368
 ‡ ALL RESISTORS ARE IN OHMS ± 10%, 1/4 WATT
 § SAMPLED ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION.

NOTES: UNLESS OTHERWISE SPECIFIED

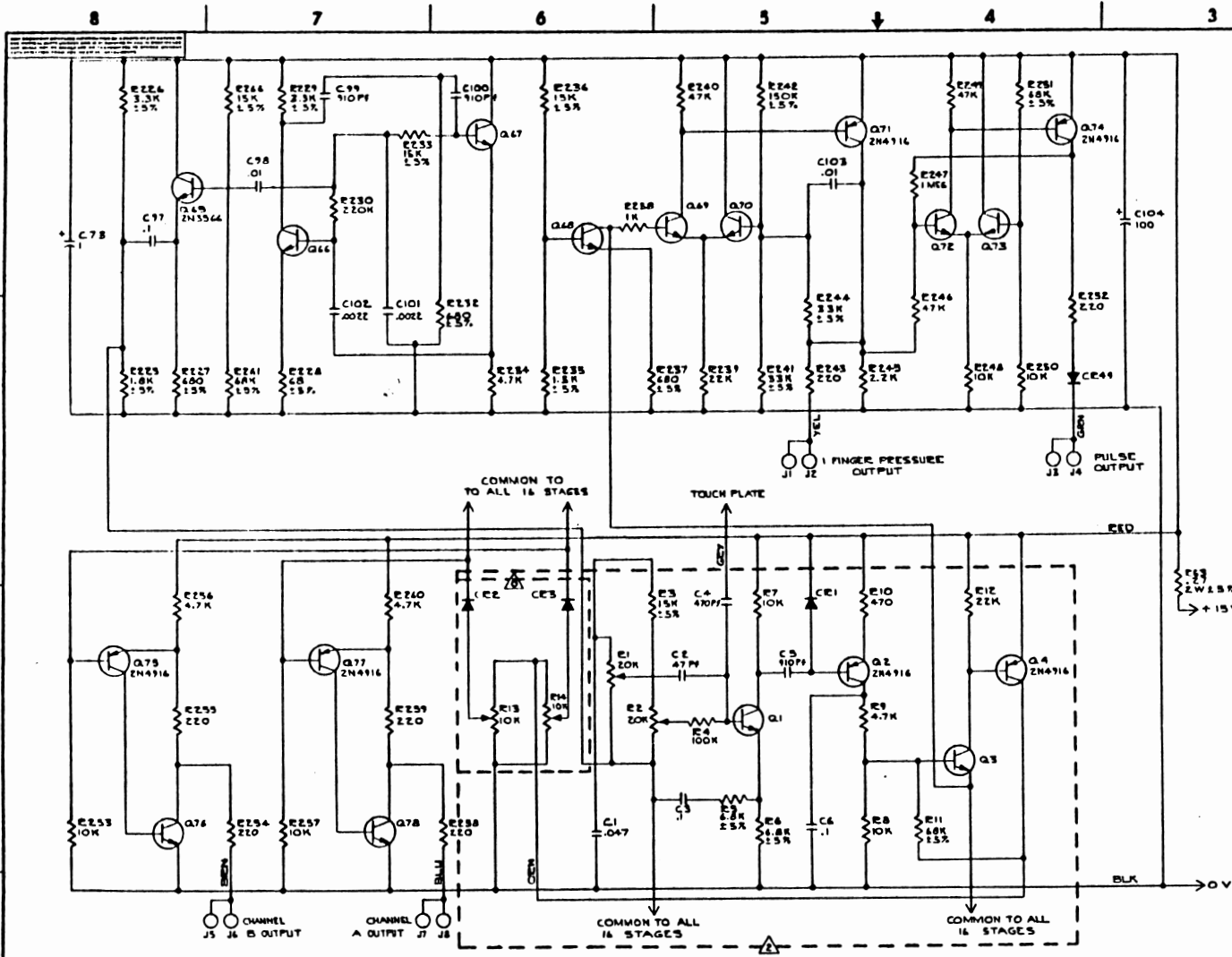
UNLESS OTHERWISE SPECIFIED		DWN	DWN VIG/L	DN	03/70	CBS MEDICAL INSTRUMENTS FULLERTON, CALIFORNIA
TOLERANCES		CHK				
FRACCTIONS	± 1%					DWG. TITLE SCHEMATIC DUAL VOLTAGE CONTROLLED GATE NO. 110
RESISTORS	± 10%					
CAPACITORS	± 10%					REL. NO. D DWG. NO. 140293
TRANSISTORS	± 10%					
DIODES	± 10%					SCALE 1 HOOR SYNTHESIZER SHEET 1 OF 1
INDUCTORS	± 10%					
CONNECTORS	± 10%					
OTHER	± 10%					



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

- NOTES: UNLESS OTHERWISE SPECIFIED
1. SAMPLES ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION
 2. ALL RESISTORS ARE IN OHMS 5% 1/4 WATT
 3. ALL TRANSISTORS ARE 2N4116
 4. ALL JACKS ARE MOUNTED ON FRONT PANEL
 5. OMITTED R42-E51 Q11-Q20 + C9-C17
 6. LAST REF DES. USED ARE R12, Q30 + C25

UNLESS OTHERWISE SPECIFIED		MATERIAL		DATE	
FRACCTIONS	TOLERANCES	DWG. NO.	1/5/70	REV.	1/1
1/2"	0.125"	CHK.	1/5/70	APPROVED	1/1
3/8"	0.062"	APPROVED	1/1	DATE	1/1
1/4"	0.031"	MATERIAL	1/1	DATE	1/1
3/16"	0.0156"				
1/8"	0.0078"				
3/32"	0.0039"				
1/16"	0.0019"				
3/64"	0.0009"				
1/32"	0.0005"				
1/64"	0.0002"				
1/128"	0.0001"				
1/256"	0.00005"				
1/512"	0.000025"				
1/1024"	0.0000125"				
1/2048"	0.00000625"				
1/4096"	0.000003125"				
1/8192"	0.0000015625"				
1/16384"	0.00000078125"				
1/32768"	0.000000390625"				
1/65536"	0.0000001953125"				
1/131072"	0.00000009765625"				
1/262144"	0.000000048828125"				
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STAGES 1 THRU 16															
RESISTORS															
R1	15	29	43	57	71	85	99	113	127	141	155	169	183	197	211
R2	16	30	44	58	72	86	100	114	128	142	156	170	184	198	212
R3	17	31	45	59	73	87	101	115	129	143	157	171	185	199	213
R4	18	32	46	60	74	88	102	116	130	144	158	172	186	200	214
R5	19	33	47	61	75	89	103	117	131	145	159	173	187	201	215
R6	20	34	48	62	76	90	104	118	132	146	160	174	188	202	216
R7	21	35	49	63	77	91	105	119	133	147	161	175	189	203	217
R8	22	36	50	64	78	92	106	120	134	148	162	176	190	204	218
R9	23	37	51	65	79	93	107	121	135	149	163	177	191	205	219
R10	24	38	52	66	80	94	108	122	136	150	164	178	192	206	220
R11	25	39	53	67	81	95	109	123	137	151	165	179	193	207	221
R12	26	40	54	68	82	96	110	124	138	152	166	180	194	208	222
R13	27	41	55	69	83	97	111	125	139	153	167	181	195	209	223
R14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224

TRANSISTORS															
Q1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61
Q2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62
Q3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63
Q4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64

CAPACITORS															
C1	6	11	16	21	26	31	36	41	46	51	56	61	66	71	76
C2	7	12	17	22	27	32	37	42	47	52	57	62	67	72	77
C3	8	13	18	23	28	33	38	43	48	53	58	63	68	73	78
C4	9	14	19	24	29	34	39	44	49	54	59	64	69	74	79
C5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

DIODES															
CE1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46
CE2	5	8	11	14	17	20	23	26	29	32	35	38	41	44	47
CE3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48

- ▲ COMPONENTS ARE MOUNTED ON FRONT PANEL
 7 ALL JACKS ARE MOUNTED ON FRONT PANEL
 ▲ ALL DIODES ARE IN437
 8 ALL CAPACITORS ARE IN MICROFARADS
 4 ALL TRANSISTORS ARE 2N3843
 3 ALL RESISTORS ARE IN OHMS 1/4 WATT
 1 THIS STAGE TO BE REPEATED 15 TIMES
 1 SAMPLES ON FIRST ASSEMBLY MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION

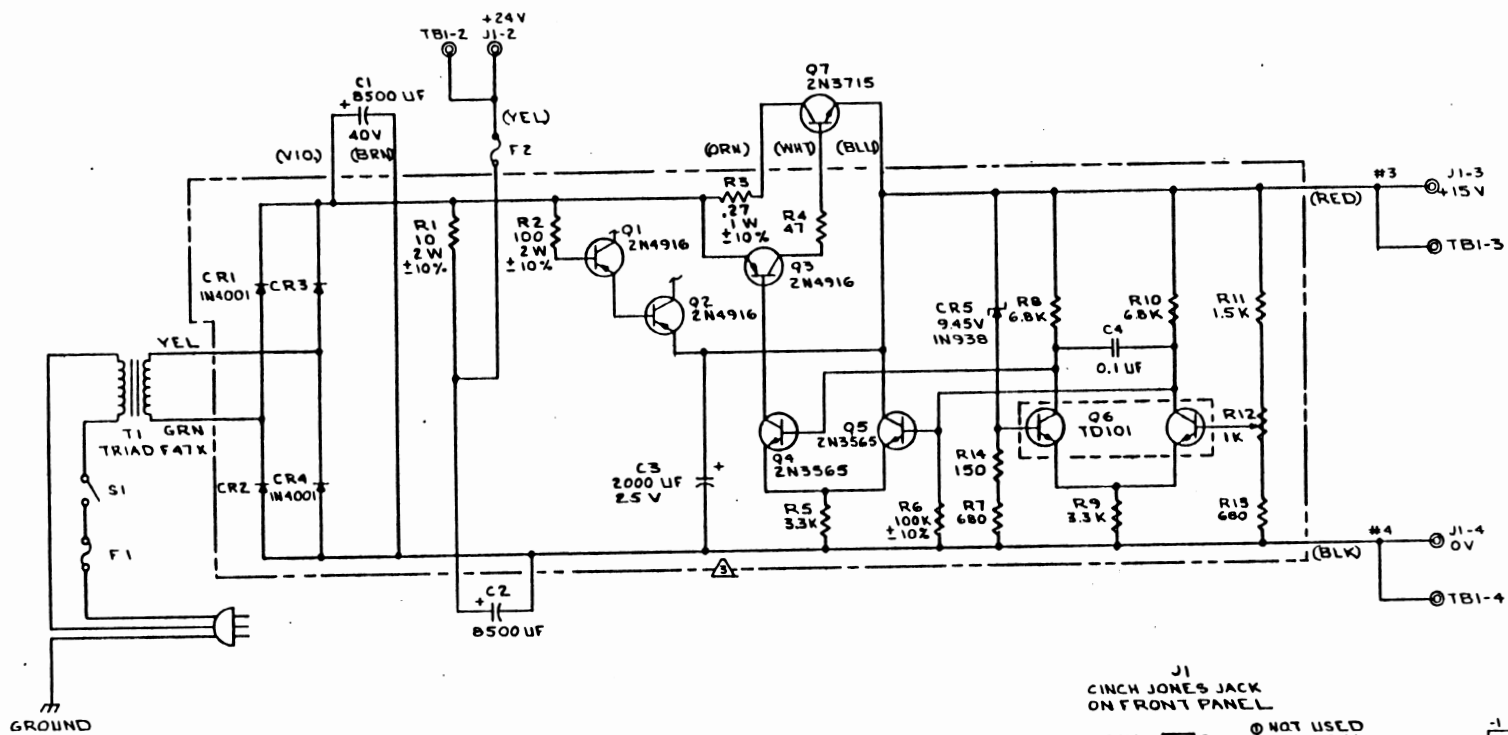
NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED	DWG	DAW VIGIL	10/7/72
TOLERANCES	CHK	<i>[Signature]</i>	10/11/72
FRACCTIONS	APPD		
INCHES	APPD		
FRACTIONAL INCHES	APPD		
HOLES - DIMS	APPD		
HOLES - DRILLED & FINISHED	APPD		
STANDARDS	APPD		
UNLESS OTHERWISE SPECIFIED	FRONT		
ALL DIMENSIONS ARE IN INCHES	COLOR		
DO NOT SCALE DRAWING			

CBS		ELECTRONIC INSTRUMENTS	
RIVERSIDE, CALIFORNIA		RIVERSIDE, CALIFORNIA	
SCHEMATIC TOUCH CONTROLLED VOLTAGE SOURCE NO. 112			
REL. NO.	DWG. NO.	REV.	
D	140319	D	
SCALE	AS SHOWN	SHEET 1 OF 1	

1. THE CHG. ON THIS DRAWING SHALL BE APPROVED BY THE CHG. ENGINEER.

REVISIONS			
REV	DESCRIPTION	REVISED BY	DATE



J1
CINCH JONES JACK
ON FRONT PANEL

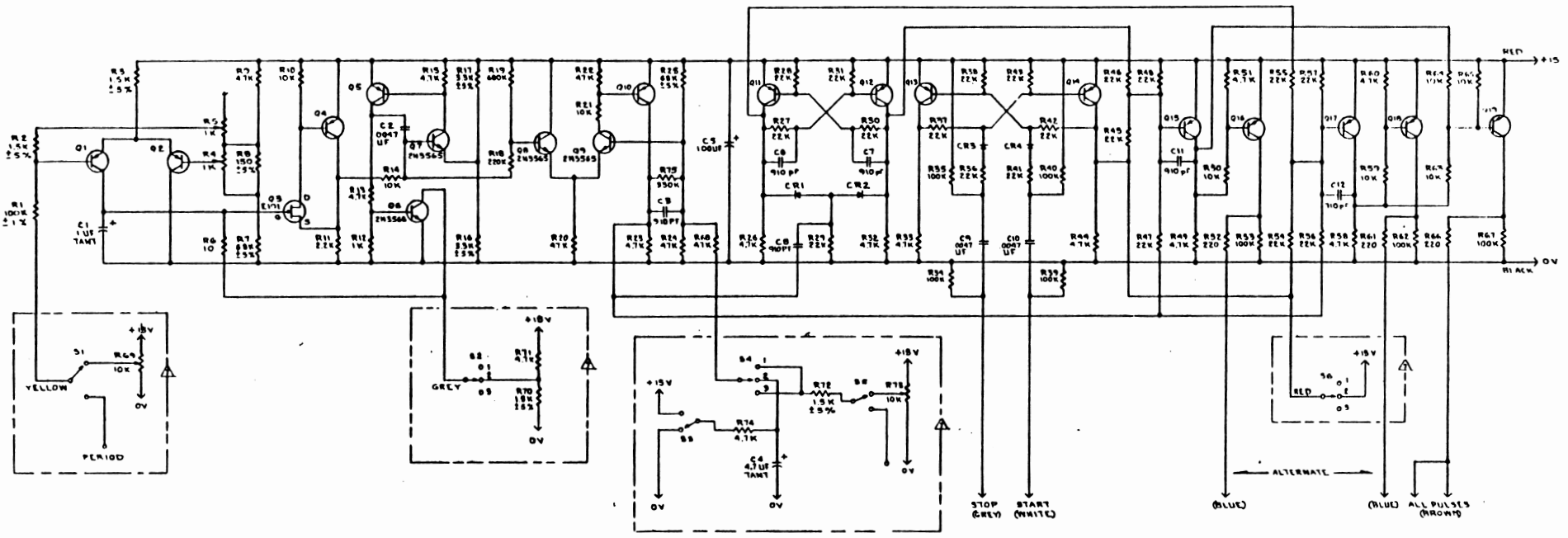
+24V @ - 1 0
GND @ - 1 0

0 NOT USED
0 YELLOW
0 RED
0 BLACK

TBI
- 1 - 2 - 3 - 4
0 0 0 0
YEL RD BLK

ALL COMPONENTS MOUNTED ON P.C. BOARD, ALL OTHERS ARE MOUNTED ON FRONT PANEL
 2 LAST REFERENCE DESIGNATION USED C 4, CR5, Q7, (R14 OUT OF SEQUENCE)
 1 ALL METAL FILM RESISTORS ARE IN OHMS ± 5%, 1/4 W
 NOTES: UNLESS OTHERWISE SPECIFIED

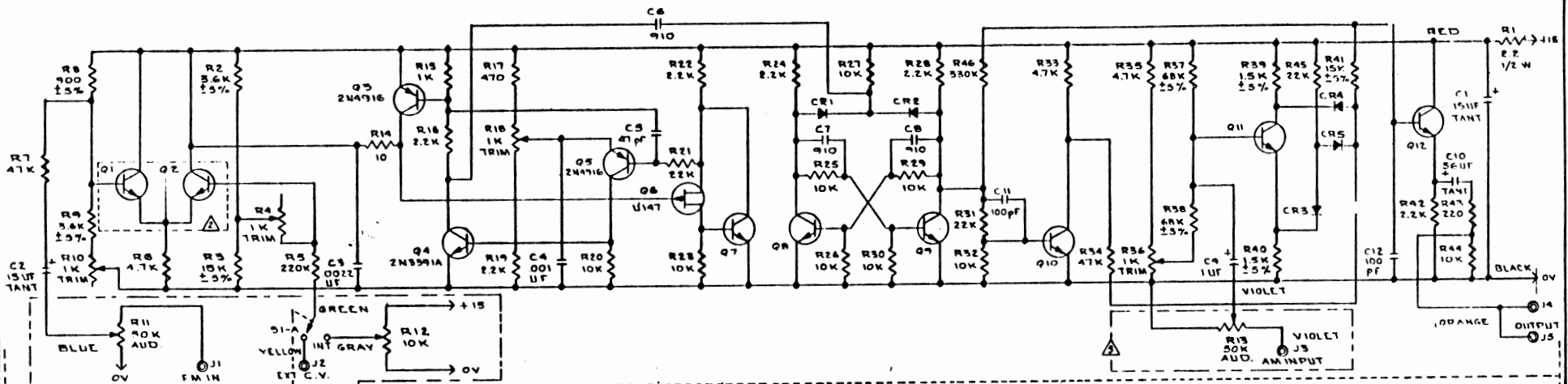
UNLESS OTHERWISE SPECIFIED		OWN	DATE	CBS	
FRACIONS	RESISTANCE	OK	10/20/70	MUSICAL INSTRUMENTS PALMISTON, CALIFORNIA	
J1	0 1/2	OK	7/1	DWS TITLE SCHEMATIC	
J2	0 1/2	OK	7/1	POWER SUPPLY- # 115	
J3	0 1/2	OK	7/1	REV. NO. D DWS. NO. 139741	
J4	0 1/2	OK	7/1	SCALE 1/16" = 1"	
J5	0 1/2	OK	7/1	SYNTHESIZER #115 SHEET 1 OF 1	
J6	0 1/2	OK	7/1		
J7	0 1/2	OK	7/1		
J8	0 1/2	OK	7/1		
J9	0 1/2	OK	7/1		
J10	0 1/2	OK	7/1		
J11	0 1/2	OK	7/1		
J12	0 1/2	OK	7/1		
J13	0 1/2	OK	7/1		
J14	0 1/2	OK	7/1		
J15	0 1/2	OK	7/1		
J16	0 1/2	OK	7/1		
J17	0 1/2	OK	7/1		
J18	0 1/2	OK	7/1		
J19	0 1/2	OK	7/1		
J20	0 1/2	OK	7/1		
J21	0 1/2	OK	7/1		
J22	0 1/2	OK	7/1		
J23	0 1/2	OK	7/1		
J24	0 1/2	OK	7/1		
J25	0 1/2	OK	7/1		
J26	0 1/2	OK	7/1		
J27	0 1/2	OK	7/1		
J28	0 1/2	OK	7/1		
J29	0 1/2	OK	7/1		
J30	0 1/2	OK	7/1		
J31	0 1/2	OK	7/1		
J32	0 1/2	OK	7/1		
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J34	0 1/2	OK	7/1		
J35	0 1/2	OK	7/1		
J36	0 1/2	OK	7/1		
J37	0 1/2	OK	7/1		
J38	0 1/2	OK	7/1		
J39	0 1/2	OK	7/1		
J40	0 1/2	OK	7/1		
J41	0 1/2	OK	7/1		
J42	0 1/2	OK	7/1		
J43	0 1/2	OK	7/1		
J44	0 1/2	OK	7/1		
J45	0 1/2	OK	7/1		
J46	0 1/2	OK	7/1		
J47	0 1/2	OK	7/1		
J48	0 1/2	OK	7/1		
J49	0 1/2	OK	7/1		
J50	0 1/2	OK	7/1		
J51	0 1/2	OK	7/1		
J52	0 1/2	OK	7/1		
J53	0 1/2	OK	7/1		
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J76	0 1/2	OK	7/1		
J77	0 1/2	OK	7/1		
J78	0 1/2	OK	7/1		
J79	0 1/2	OK	7/1		
J80	0 1/2	OK	7/1		
J81	0 1/2	OK	7/1		
J82	0 1/2	OK	7/1		
J83	0 1/2	OK	7/1		
J84	0 1/2	OK	7/1		
J85	0 1/2	OK	7/1		
J86	0 1/2	OK	7/1		
J87	0 1/2	OK	7/1		
J88	0 1/2	OK	7/1		
J89	0 1/2	OK	7/1		
J90	0 1/2	OK	7/1		
J91	0 1/2	OK	7/1		
J92	0 1/2	OK	7/1		
J93	0 1/2	OK	7/1		
J94	0 1/2	OK	7/1		
J95	0 1/2	OK	7/1		
J96	0 1/2	OK	7/1		
J97	0 1/2	OK	7/1		
J98	0 1/2	OK	7/1		
J99	0 1/2	OK	7/1		
J100	0 1/2	OK	7/1		



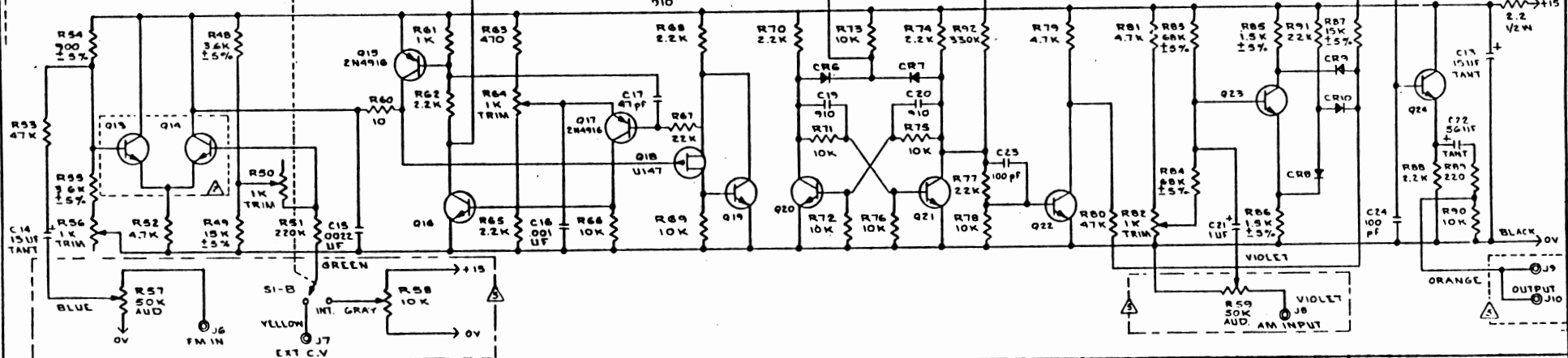
(Q1) P.C BOARD CBS P/N 158707 ASSY NO 157828
 Δ COMPONENTS MOUNTED ON FRONT PANEL
 * ALL COMPONENTS ARE MOUNTED ON P.C BOARD EXCEPT AS NOTED
 S SWITCH POSITIONS 02 THRU 04 = START, STOP
 0 = SINGLE PULSE, 0 = REPETITIVE
 4 LAST REFERENCE DESIGNATION C12, C8, Q19, S8 @ 68 RTIS, OUT OF SEQUENCE
 3 DIODES D1 THRU D4 ARE 1N457 @ D6660
 2 TRANSISTORS Q1, Q4, Q5, Q10 THRU Q19 ARE 2N4356
 1 RESISTOR: IN OHMS 10X, 1/4 W
 NOTES: UNLESS OTHERWISE SPECIFIED

DATE: 6/1/68		BY: [Signature]		CBS TIMING PULSE GENERATOR 157828
DESIGNED BY: [Signature]	CHECKED BY: [Signature]	DATE: 6/1/68	BY: [Signature]	
DRAWN BY: [Signature]		DATE: 6/1/68		D 159915 157828
APPROVED BY: [Signature]		DATE: 6/1/68		157828 159915

REVISIONS			
REV	DESCRIPTION	REV BY	DATE



A' SIDE OF P.C. BOARD
B' SIDE OF P.C. BOARD



6. LAST REFERENCE DESIGNATIONS USED ARE L, J, C24, R92, C10, Q24 & S1B (R1, R6 THRU R13, R45, R46, R47, R52 THRU R59, R91 & R92 ARE OUT OF SEQUENCE)
 7. COMPONENTS MOUNTED ON FRONT PANEL
 8. COMPONENTS MOUNTED ON P.C. BOARD EXCEPT AS NOTED
 9. ALL DIODES ARE 1N11
 10. TRANSISTORS Q1, Q2, Q13 & Q14 ARE DUAL INLETS ITC 122
 11. RESISTORS IN OHMS ± 10%, 1/4 WATT
 NOTES: UNLESS OTHERWISE SPECIFIED

7. TRANSISTORS ARE 2N5565 (EXCEPT AS NOTED)

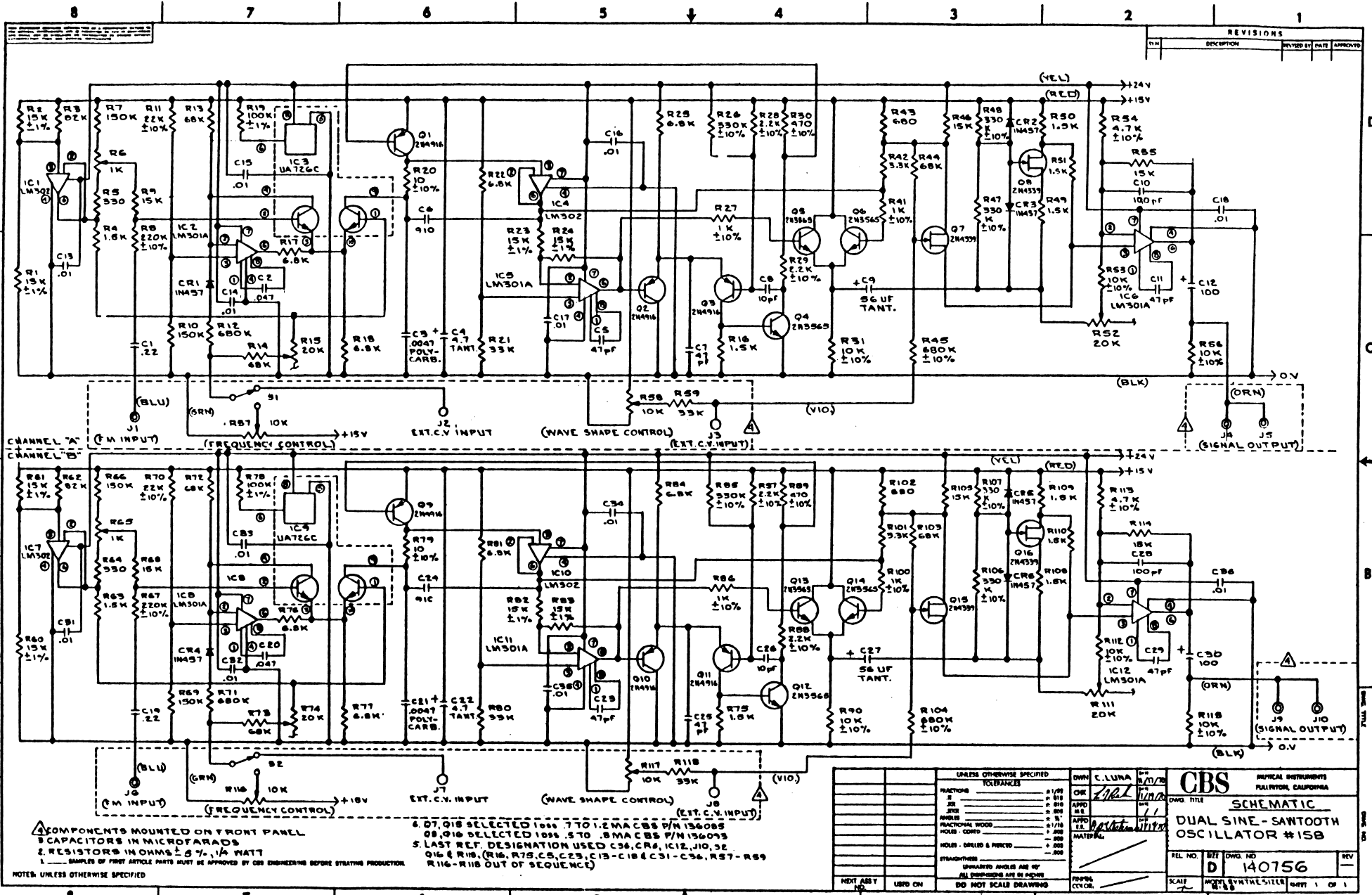
UNLESS OTHERWISE SPECIFIED TOLERANCES		DRAWN	G. K. ...	DATE	10/25/72
RESISTORS	± 1%	CHKD	M. P. ...	APP'D	...
CAPACITORS	± 5%	DATE	...	DATE	...
DIODES	± 5%	DATE	...	DATE	...
TRANSISTORS	± 5%	DATE	...	DATE	...
INDUCTORS	± 5%	DATE	...	DATE	...
COILS	± 5%	DATE	...	DATE	...
FRAGMENTS	± 5%	DATE	...	DATE	...
DIMENSIONS ARE BY		SCALE	1:1	SCALE	...
DO NOT SCALE DRAWING		COLOR	...	SCALE	...
NET ASSY NO.	USED ON	REV. NO.	D	DWG. NO.	140160
		REV.		REV.	

CBS MUSICAL INSTRUMENTS
 VAN NUYS, CALIFORNIA

TWO TITLE
SCHEMATIC

DUAL SQUARE WAVE OSCILLATOR #144

REL. NO. **D** SHEET **1** OF **1**



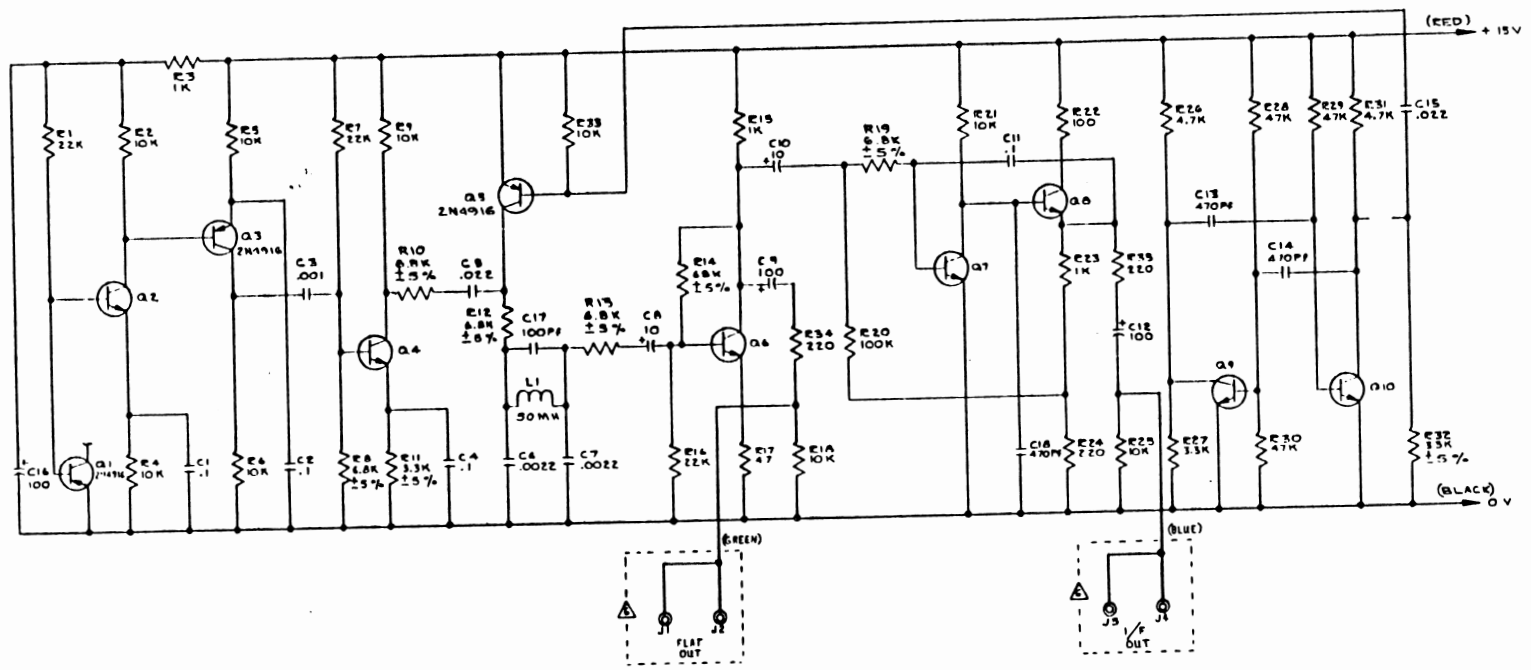
REVISIONS			
NO.	DESCRIPTION	REVISED BY	APPROVED

▲ COMPONENTS MOUNTED ON FRONT PANEL
 3 CAPACITORS IN MICROFARADS
 2 RESISTORS IN OHMS ± 5%, 1/4 WATT
 1 SAMPLES OF FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERS BEFORE STATING PRODUCTION.
 NOTES UNLESS OTHERWISE SPECIFIED

6, 07, 018 SELECTED 1984, 770 TO 1.2M CBS P/N 136085
 08, 016 SELECTED 1984, 570 .8M CBS P/N 136093
 5, LAST REF. DESIGNATION USED C36, C44, IC12, J10, J2
 016 & R18, (R16, R75, C23, C13-C18 & C31-C36, R57-R59
 R116-R118 OUT OF SEQUENCE)

UNLESS OTHERWISE SPECIFIED		DWN		C. LUNA		8/20/78	
FRACCTIONS	TOLERANCES	CHK	APPR	DATE	REV	DWG TITLE	
J	± 1%					SCHEMATIC	
J2	± 5%					DUAL SINE-SAWTOOTH	
J3	± 10%					OSCILLATOR #15B	
J4	± 20%					REL. NO. 811 DWG. NO. 140756	
J5	± 50%					SCALE 1:1	
J6	± 100%					PART 1 OF 1	
J7	± 100%						
J8	± 100%						
J9	± 100%						
J10	± 100%						
J11	± 100%						
J12	± 100%						
J13	± 100%						
J14	± 100%						
J15	± 100%						
J16	± 100%						
J17	± 100%						
J18	± 100%						
J19	± 100%						
J20	± 100%						
J21	± 100%						
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J99	± 100%						
J100	± 100%						

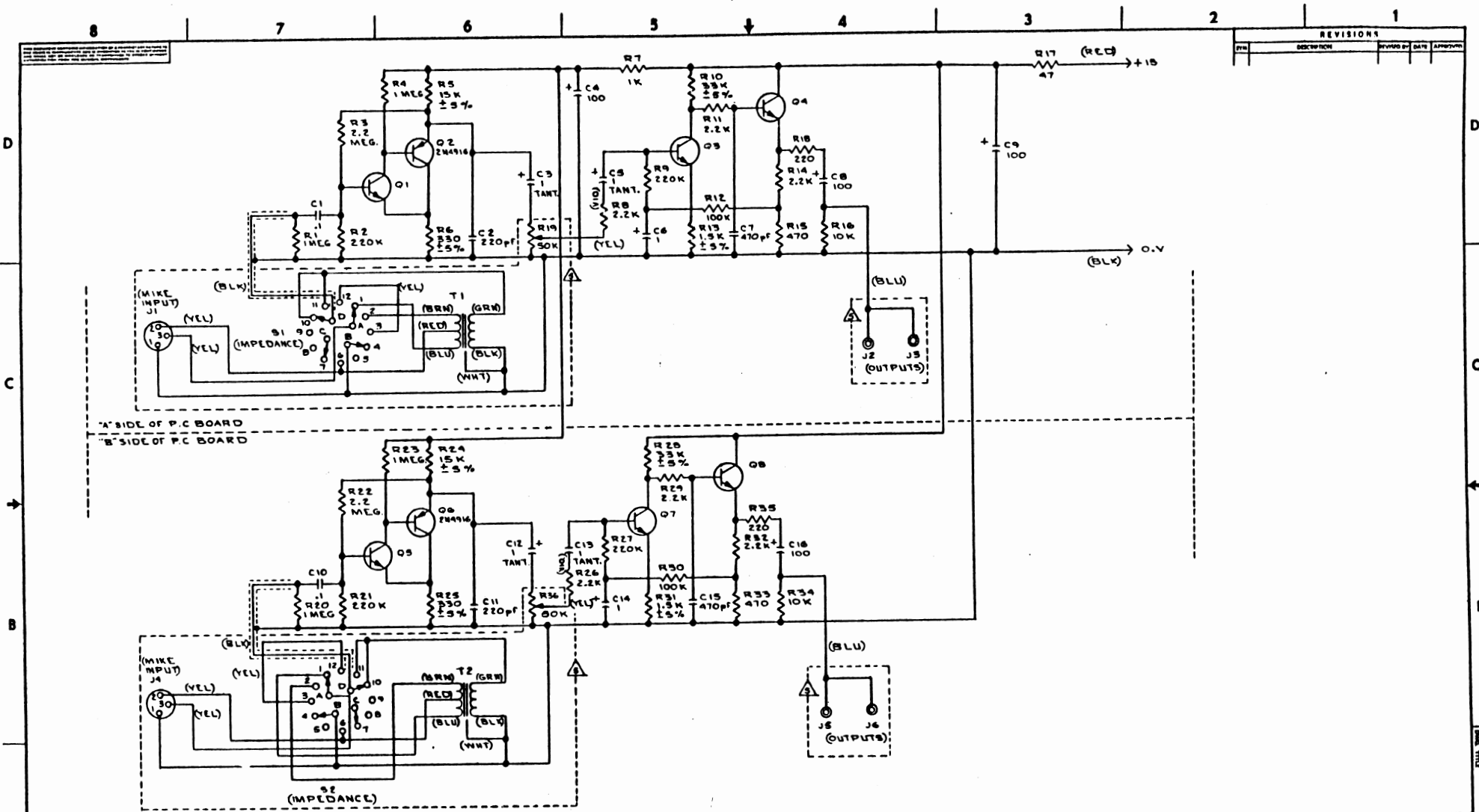
REVISIONS			
NO.	DESCRIPTION	APPROVED BY	DATE
1			



- ▲ COMPONENTS MOUNTED ON FRONT PANEL ALL OTHERS ARE MOUNTED ON P.C BOARD
 5 LAST REFERENCE DESIGNATION USED C18, L1, Q10, R35 (E.G. C17, C18, R33, R34, R35, OUT OF SEQUENCE)
 4 ALL RESISTORS ARE IN OHMS - 10X, 1/4 W
 3 ALL CAPACITORS ARE IN MICROFARADS
 2 ALL TRANSISTORS ARE 2N3568
 1 SAMPLES ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION

NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED TOLERANCES		OWN: DAN VIGIL	DATE: 1/27/72	CBS MUSICAL INSTRUMENTS FULLERTON, CALIFORNIA
FRACCTIONS	± 1/2%	CHK: [Signature]	DATE: 1/27/72	
RES	± 5%	APPRO: [Signature]	DATE: 1/27/72	DWG TITLE: SCHEMATIC
WIRE	± 1%	APPRO: [Signature]	DATE: 1/27/72	NO. 160
TRANSFORMER WOOD	± 1%	MATERIAL:		PR. NO. [Blank]
WICKS COOD	± 1%			REV. [Blank]
HOUS - DRILLED & PIERCED	± 1%			DWG. NO. D 140038
FINISHWORK	± 1%			SCALE: [Blank]
				WHEEL: [Blank]
				COLOR: [Blank]
				SHIT 1 OF 1



REVISIONS			
REV.	DESCRIPTION	APPROVED BY	DATE

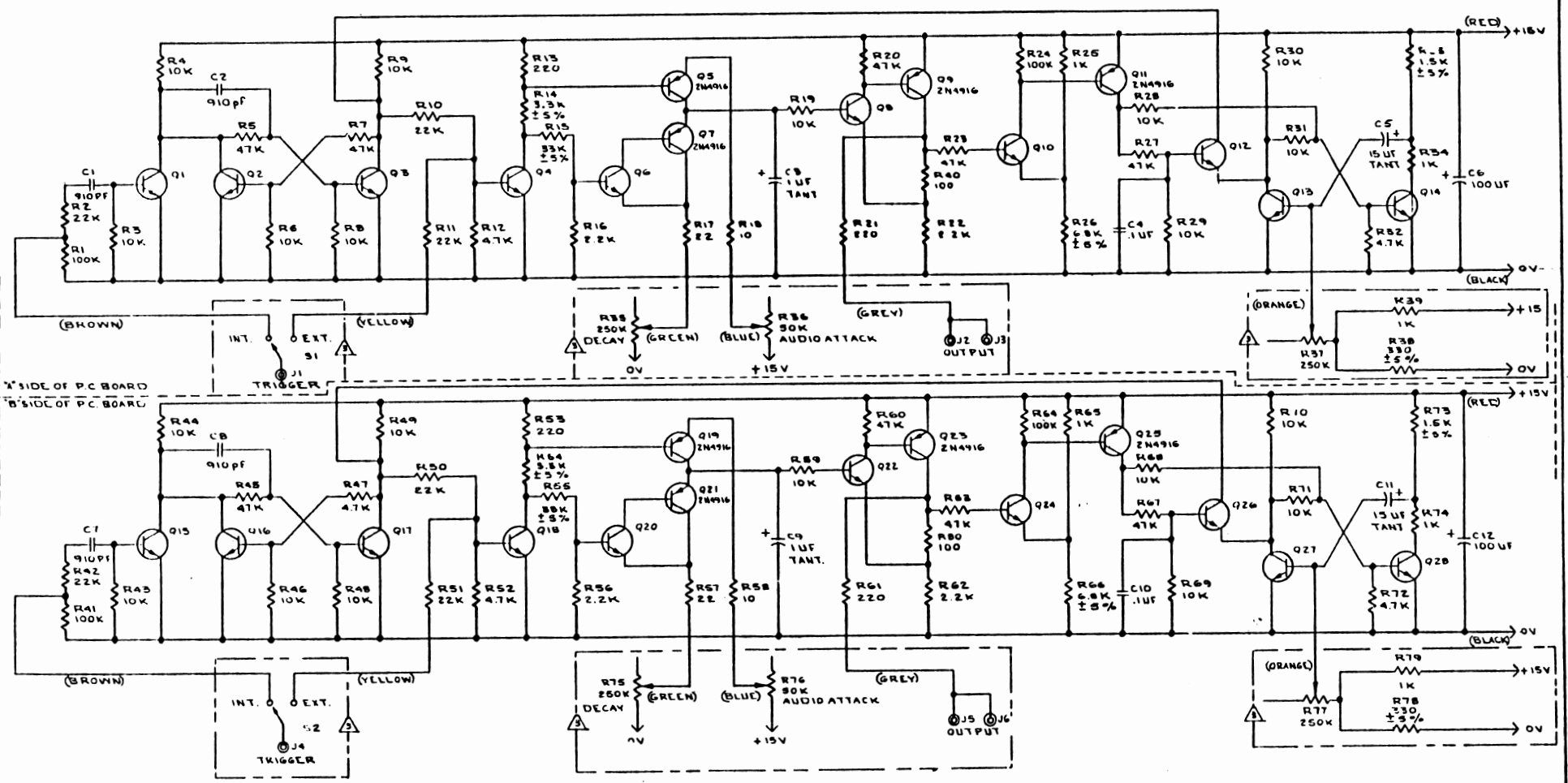
7. LAST REF. DESIGNATION USED C16, J6, Q6, R36 & T2
 (R19 & R36 OUT OF SEQUENCE)
 8. R19 & R36 ARE GAIN ADJUSTMENTS
 9. COMPONENTS MOUNTED ON FRONT PANEL
 10. COMPONENTS MOUNTED ON P.C. BOARD
 11. EXCEPT AS NOTED
 12. CAPACITORS IN MICROFARADS
 13. RESISTORS IN OHMS $\pm 10\%$, 1/4 WATT
 14. SAMPLES ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION.

NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		TOLERANCES	
FUNCTIONS	±1/2%	DRAWN	G. Jones
RESISTORS	±1%	CHKD	M. J. ...
CAPACITORS	±5%	APPROV	...
DIODES	±5%	DATE	11/17/70
TRANSISTORS	±5%	APP'D	...
INDUCTORS	±5%	DATE	11/17/70
COILS - DRUMS & PERCO	±5%	MATERIAL	...
HOLES - DRUMS & PERCO	±5%	PHYSICAL	...
TRANSFORMERS	±5%	CONTR.	...
DIAGRAMMED ANGLES ARE 90°			
ALL DIMENSIONS ARE IN INCHES			
DO NOT SCALE DRAWINGS			

REL. NO.	REV.	DWG. NO.	REV.
	D	140616	
SCALE	MODEL	DATE	SHEET
			1 OF 1

REVISIONS				
NO.	DESCRIPTION	NUMBER	DATE	APPROVED



A SIDE OF P.C. BOARD
B SIDE OF P.C. BOARD

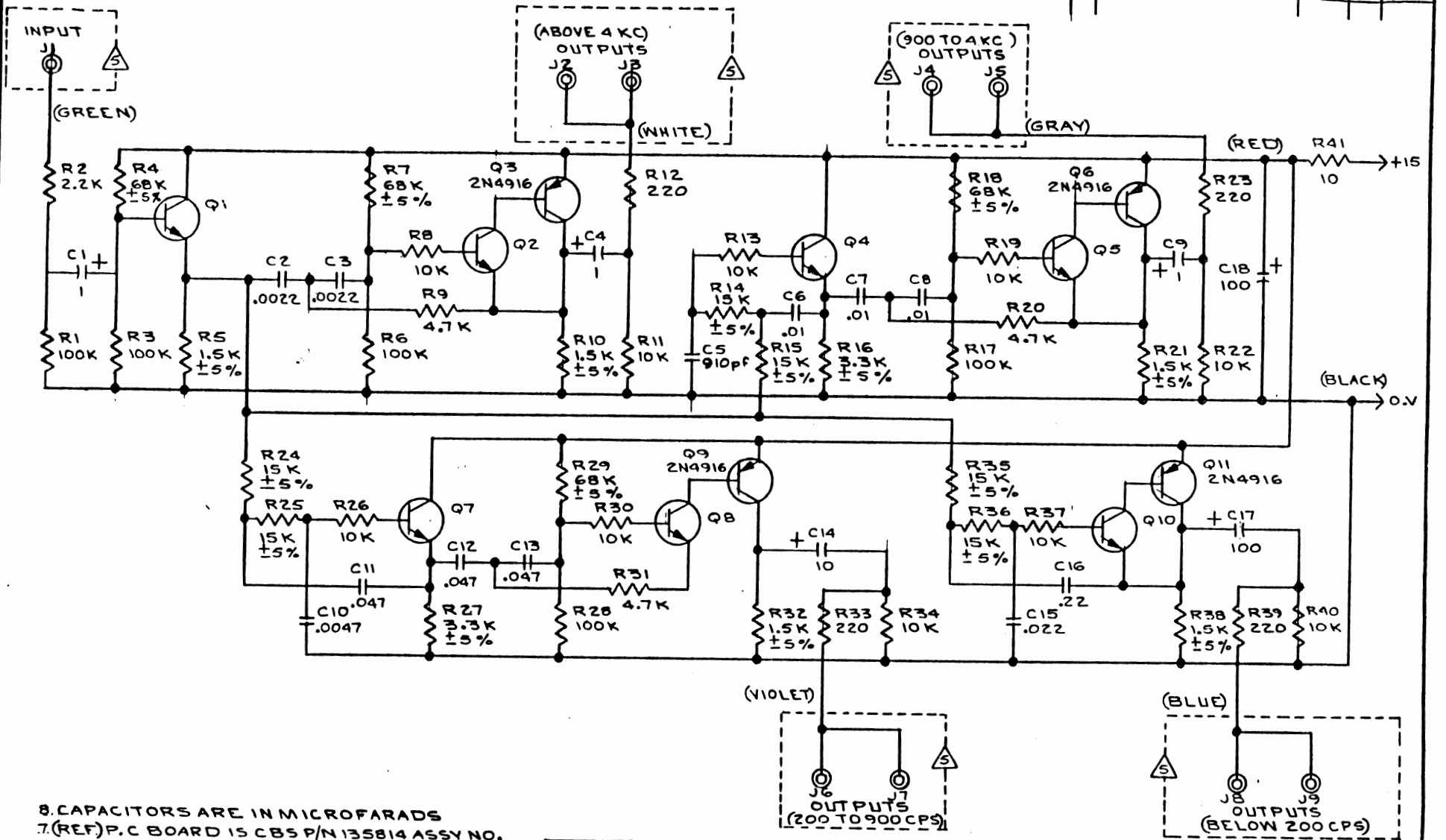
5 (REFERENCE) P.C. BOARD CBS P/N 135798
ASSY NO 138024
4. LAST REFERENCE DESIGNATION USED ARE
C12, Q28, H40, S2, J6
▲ COMPONENTS MOUNTED ON FRONT PANEL
COMPONENTS MOUNTED ON P.C. BOARD
EXCEPT AS NOTED
2 TRANSISTORS ARE 2N3565
1. RESISTORS IN OHMS ±10%, 1/4 WATT
NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		DRAWN	CHECKED	DATE	DATE
TOLERANCES		C. Collins	W. J. ...	9/17/70	8/21/70
FRACTIONS	±1%				
INCHES	±0.1%				
MILS	±0.1%				
ANGLES	±0.1°				
DIAGONAL HOLES	±0.1%				
HOLE - CORE	±0.1%				
HOLE - DRILLED & FINISH	±0.1%				
SPACINGS	±0.1%				
UNHATCHED ANGLES ARE 90°					
ALL DIMENSIONS ARE IN INCHES					
DO NOT SCALE DRAWINGS					
NEXT ASSY NO.	USED ON	FINISH COLOR			

CBS		MUSICAL INSTRUMENTS PALM BEACH, CALIFORNIA	
DRAWN TITLE		SCHEMATIC	
DUAL ATTACK GENERATOR		#180	
REL. NO.	SHEET	DWG. NO.	REV.
	D	139956	
SCALE	MICRO	SYNTHESIZER, R.180	SHEET 1 OF 1

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REVISIONS			
SYM	DESCRIPTION	REVISED BY	DATE



- 8. CAPACITORS ARE IN MICROFARADS
- 7. (REF) P.C BOARD IS CBS P/N 135814 ASSY NO. 130081
- 6. LAST REFERENCE DESIGNATIONS USED ARE: C19, J9, Q11 & R41 (R41 & C18 OUT OF SEQUENCE)
- 5. COMPONENTS MOUNTED ON FRONT PANEL
- 4. ALL COMPONENTS MOUNTED ON P.C BOARD EXCEPT AS NOTED
- 3. TRANSISTORS ARE 2N3565
- 2. RESISTORS IN OHMS ± 10%, 1/4 W
- 1. SAMPLES ON FIRST ARTICLE PARTS MUST BE APPROVED BY CBS ENGINEERING BEFORE STARTING PRODUCTION.

UNLESS OTHERWISE SPECIFIED TOLERANCES		DWN	DATE
FRACTIONS	± 1/32	<i>C. Silva</i>	11/3/70
.X	± .015	CHK	DATE
.XX	± .010	<i>[Signature]</i>	11/4/70
.XXX	± .003	APPD	DATE
ANGLES	± 1/2°	<i>[Signature]</i>	1/1
FRACTIONAL WOOD	± 1/16	APPD	DATE
HOLES - CORED	+ .005	<i>D. [Signature]</i>	1/4/70
HOLES - DRILLED & PIERCED	- .000	MATERIAL:	
	+ .003		
	- .000		
STRAIGHTNESS		FINISH:	
		COLOR:	
NEXT ASSY NO.	USED ON	DO NOT SCALE DRAWING	

CBS MUSICAL INSTRUMENTS
FULLERTON, CALIFORNIA

DWG. TITLE: **SCHEMATIC**

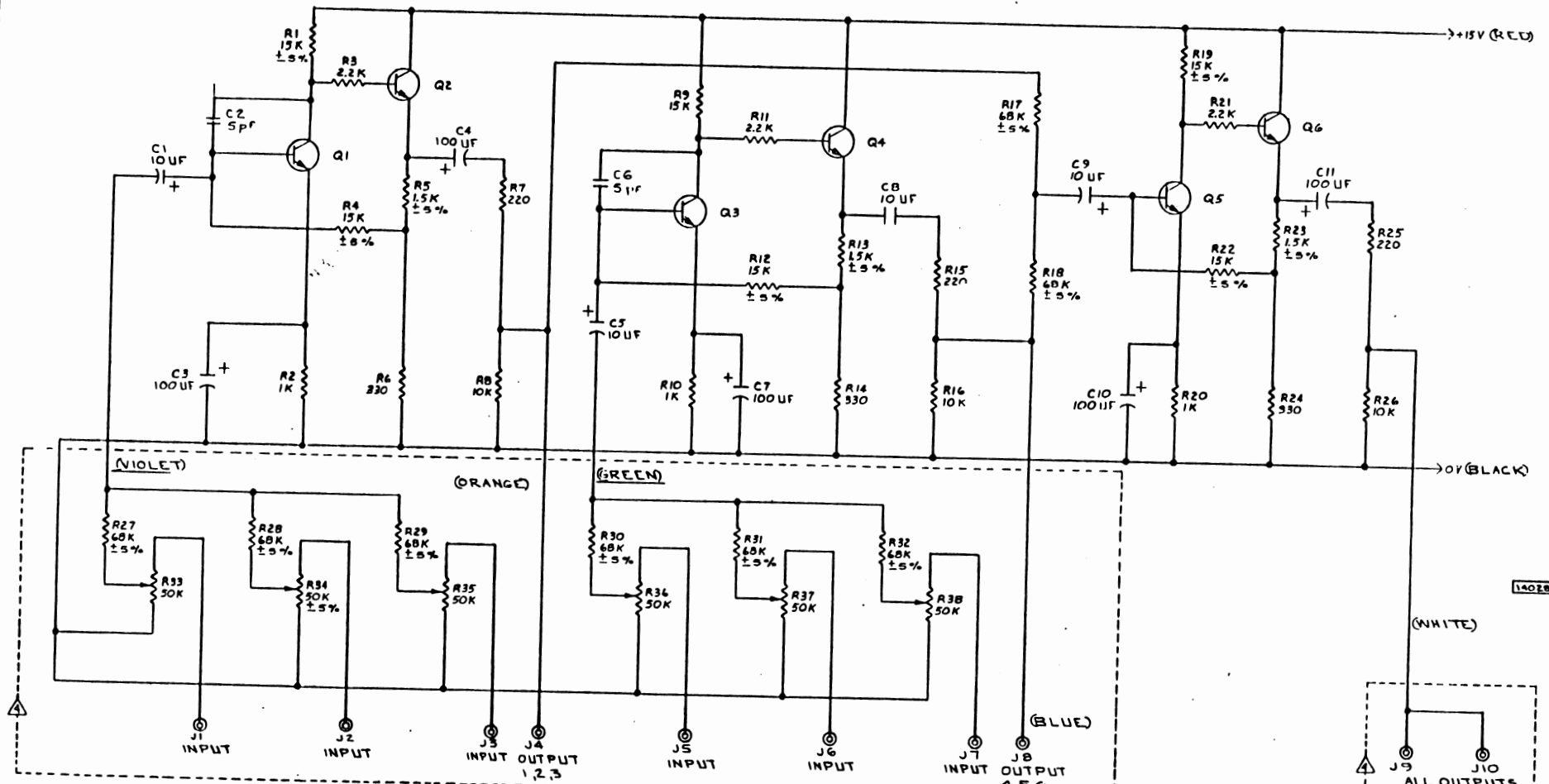
BANDPASS FILTER #194

REL. NO.	SIZE	DWG. NO.	REV
	C	140237	-

SCALE: / MODELS: IN THE SIZE #194 SHEET 1 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED

REVISIONS			
BY	DESCRIPTION	REVISED BY	DATE APPROVED



* REF. R33 THRU R38 ARE GAIN ADJUSTMENT CHANNELS
 * LAST REFERENCE DESIGNATIONS USED ARE
 * C11, J10, Q6 & R56
 * COMPONENTS MOUNTED ON FRONT PANEL
 * ALL COMPONENTS MOUNTED ON P.C. BOARD
 * EXCEPT AS NOTED
 * TRANSISTORS ARE 2N3555
 * RESISTORS ARE IN OHMS ±10%, 1/4 W
 * UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED		DWR	M.A.N	DATE
FRACCTIONS	TOLERANCES	0/100	CHR	5-4-70
BY		0/100	APPD	11-3-70
JDR		0/100	IN E	
ANODS		0/100	APPD	
FRACCHON WOOD		0/100	E.E.	11-17-70
HOLS - CORR		0/100		
HOLS - DRILLED		0/100		
UNDRILLED		0/100		
UPD ON				

CBS MUSICAL INSTRUMENTS SANTA ANA, CALIFORNIA	
DWG TITLE SIX CHANNEL MIXER	
DWG NO. 140285	
REL. NO.	REV.
D	1
SCALE AS NOTED	
SHEET 1 OF 1	

