V-B-644

# VOLTAGE MEASUREMENTS

## 1 972 - CHAMPION RECEIVER

REFERENCE DRAWINGS B-637, B-644

Nominal Values and Tolerances

Batt: $4.8 \pm {}^{.3}_{.4}$
Reg: $3.3 \pm .17$
AGC: $1.2 \pm {}^{.05}_{.1}$

Collector

Q7 $3.0 \pm .1$

Emitter

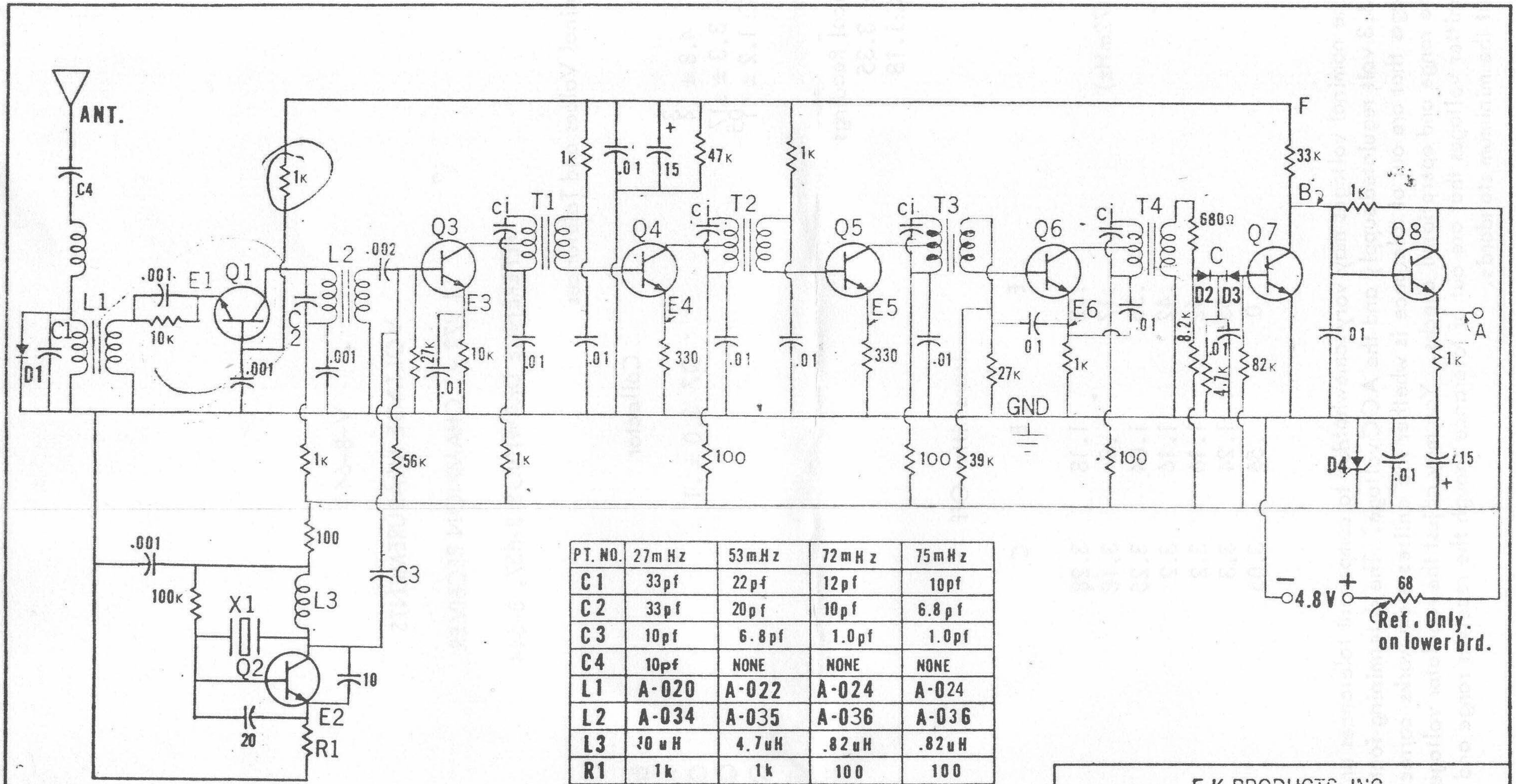
Q1, Q3, and Q6 $.5 \pm .05$
Q4 and Q5 $.4 \pm .05$
Q2 (72mHz $.1 + .05 - .02$)
(27 and 53 mHz .8 to 1.4)

Typical Readings
Reg: 3.35
AGC:1.18

Transmitter Off

| | E | B | C |
|---|---|---|---|
| Q1 | .52 | 1.18 | 3.28 |
| Q2 (72mHz) | .17 | .8 | 3.18 |
| Q3 | .56 | 1.04 | 3.25 |
| Q4 | .42 | 1.16 | 3.2 |
| Q5 | .42 | 1.16 | 3.2 |
| Q6 | .55 | 1.24 | 3.3 |
| Q7 | 0 | .56 | 3.05 |

The nominal voltages may vary somewhatdue to component tolerances and variations in the 3.3 volt regulated supply and the AGC voltage. The determining factor for adjusting voltages that are out of tolerance is whether the entire system works correctly or not, such as the range and operational checks. You may adjust the regulator voltages, AGC voltage, or emitter voltages that are out of tolerance though the receiver range and operation checks are at the minimum standards.




| PT. NO. | 27mHz | 53mHz | 72mHz | 75mHz |
|---|---|---|---|---|
| C1 | 33pf | 22pf | 12pf | 10pf |
| C2 | 33pf | 20pf | 10pf | 6.8pf |
| C3 | 10pf | 6.8pf | 1.0pf | 1.0pf |
| C4 | 10pf | NONE | NONE | NONE |
| L1 | A-020 | A-022 | A-024 | A-024 |
| L2 | A-034 | A-035 | A-036 | A-036 |
| L3 | 10 uH | 4.7uH | .82uH | .82uH |
| R1 | 1k | 1k | 100 | 100 |
| Q1 | ORG/RED | ORG/YEL | YEL/ORG | YEL/ORG |
| Q2 | WHT/GREY VIOLET | GREY/WHT. | WHITE | WHITE |
| Q3 | ORG/RED | YELLOW | YELLOW | YELLOW |
| Q4 | BLU/GRN | BLU/GRN | BLU/GRN | BLU/GRN |
| Q5 | " | " | " | " |
| Q6 | " | " | " | " |

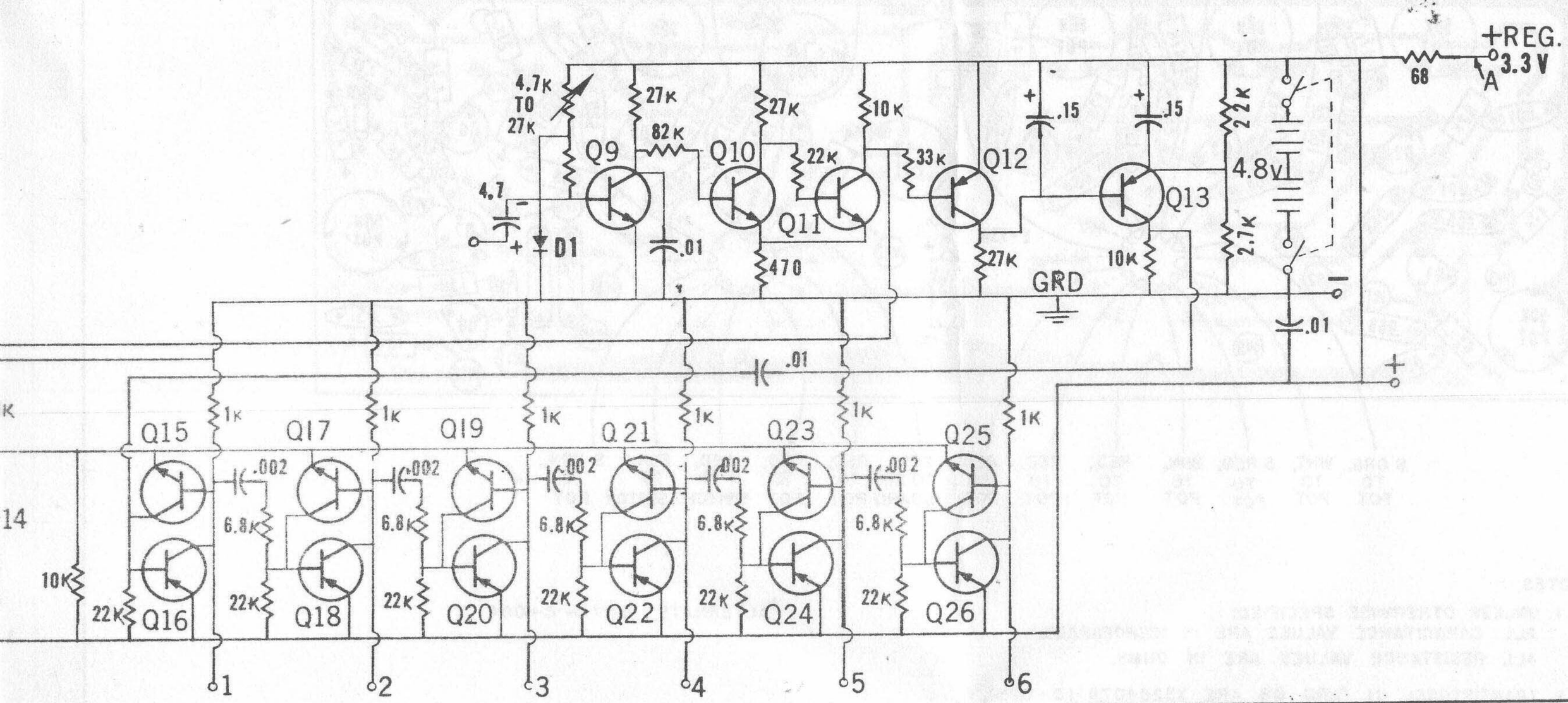
| | |
|---|---|
| Q-029 | |
| Q029 | |
| Q029 | |
| Q029 | |
| " | |
| " | |

E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST, TEXAS 76053

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| — 0 — | | | |
| DATE 2-29-72 | CHANGED TO NONE | LDC | 4-26-74 |
| DR RLE CKD RLE | | | |
| APVD RLE | | | |

TITLE RF-CHAMP. REC'R 72

NO. B 644

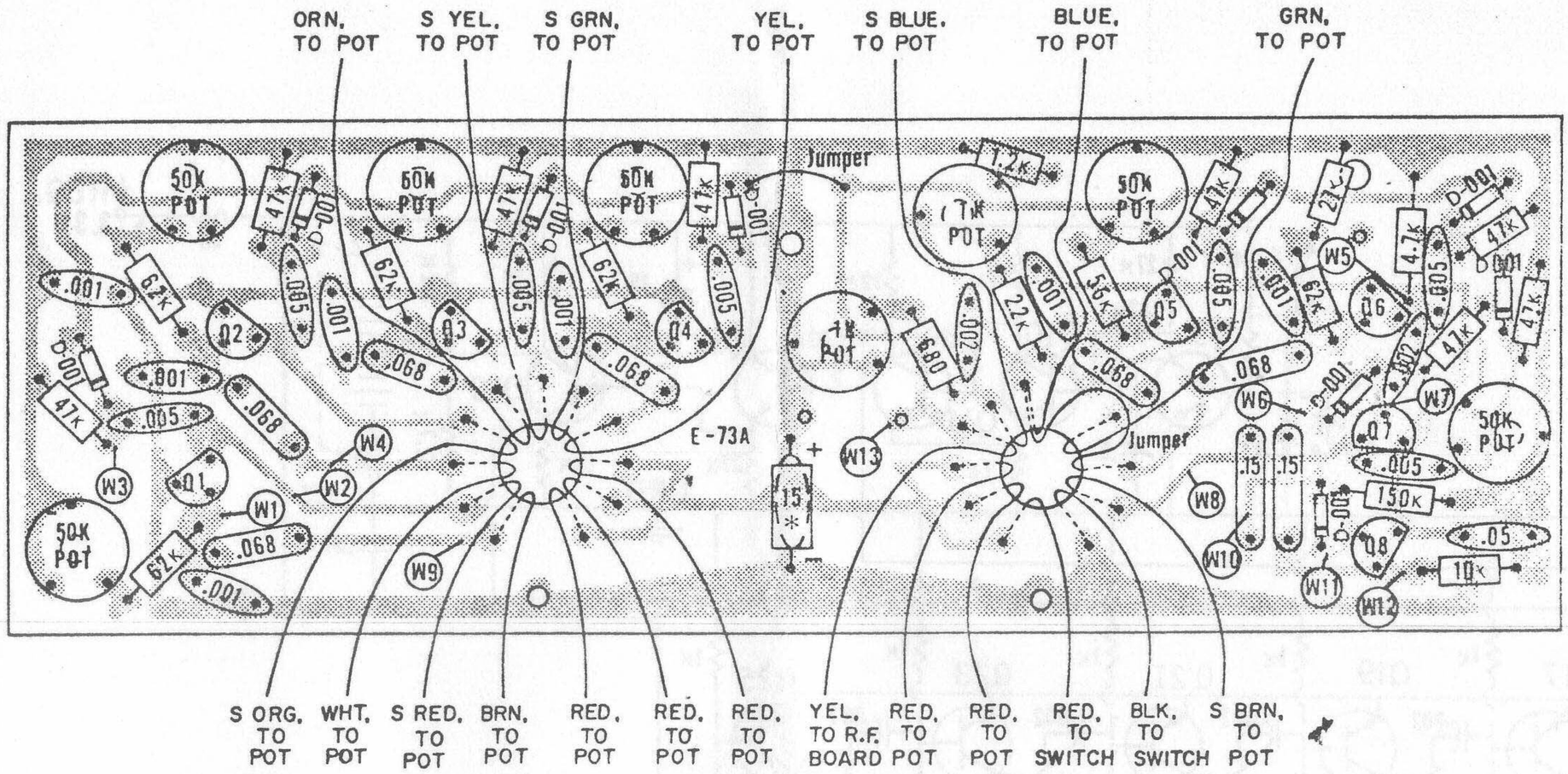



E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST, TEXAS 76053

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 2-29-72 | | | |
| DR'N RJE CKD RJE | | | |
| AP'VD RJE | | | |

TITLE DECODER CHAMPET

NO. B645




NOTES

1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q1 THRU Q8 ARE X32B4079 (Q-025).
3. DIODES: ALL ARE DA2208 (D-001).

*ALTERNATE PART — C-084

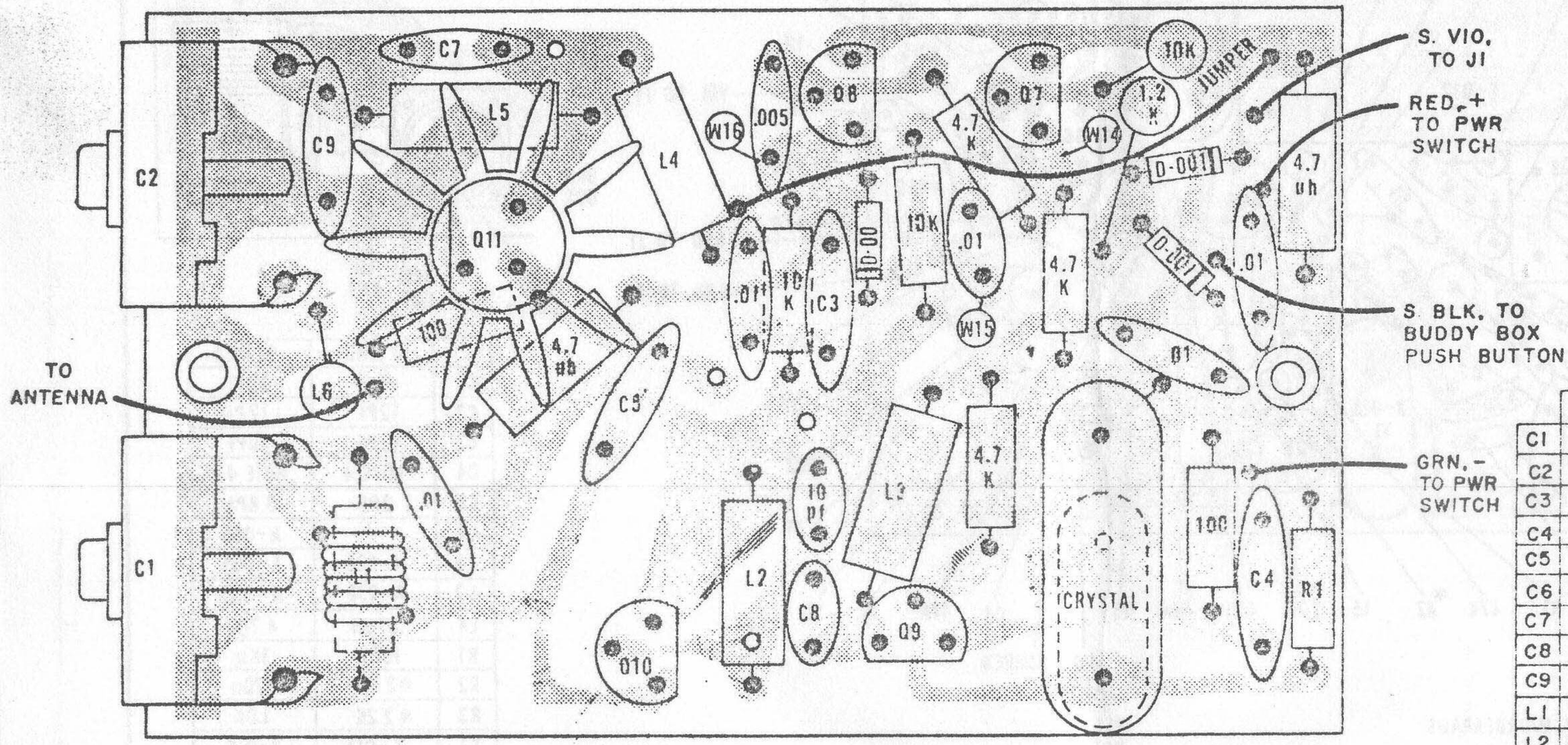
E-T PRODUCTS, INC.
3233 W. EULESS BLVD., EULESS, TEXAS 76039

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 6-15-73 | | | |
| DR'N MWP / CKD | ADD | | |
| APVD | | | |

TITLE PARTS LOCATAION: 6 CH. ENCODER
LOG-CHAMPION & LOG. SUPER PRO

NO B-654

BRUNING 40-105




| | 27 mHz | 53 mHz | 72 mHz |
|---|---|---|---|
| C1 | ARCO 404 | ARCO 404 | ARCO 403 |
| C2 | ARCO 402 | ARCO 402 | ARCO 402 |
| C3 | .01 uf | .05 uf | .05 uf |
| C4 | 68 pf | 33pf | 33 pf |
| C5 | 33 pf | 20 pf | 20 pf |
| C6 | OMITTED | OMITTED | OMITTED |
| C7 | 47 pf | 10 pf | 6.8 pf |
| C8 | 10 pf | 10 pf | 6.8 pf |
| C9 | 33pf | 20pf | 15 pf |
| L1 | .68uh | .22 uh | COIL-BUFFER |
| L2 | 100 Ω RES | 4.7 uh | 4.7 uh |
| L3 | 1.5 uh | .68 uh | .33 uh |
| L4 | 22 uh | 4.7uh | 4.7uh |
| L5 | .15 uh | .22 uh | .22uh |
| L6 | 4.7 uh | 1.5 uh | .68 uh |
| R1 | 4.7 K | 1.2 K | 1.2 K |

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q9 & Q10 ARE D32 F4 (Q-020). Q11 IS 2N5128/5129 (Q-010). Q7 & Q8 ARE X34A1165 (Q-026).
3. HEAT SINK FINS BENT TO CLEAR CONTROL STICK TRIM LEVER.

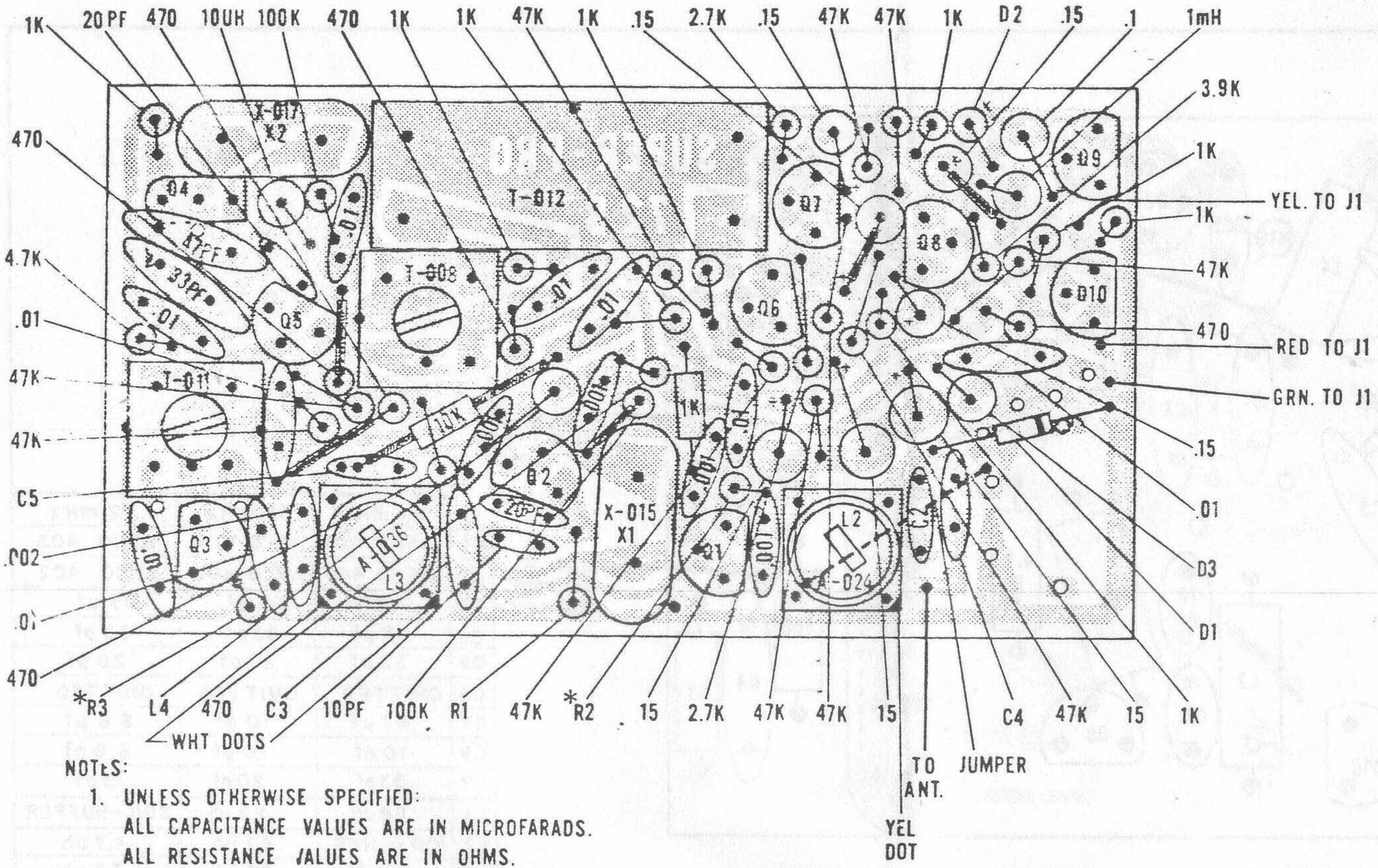
E K PRODUCTS, INC.
~~1233 W. EULESS BLVD., HURST, TEXAS 76053~~

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 6-22-73 | ADDED CHECK POINTS | DD | 12-25-73 |
| DR'N MEP / CKD. | | | |
| APVD | | | |

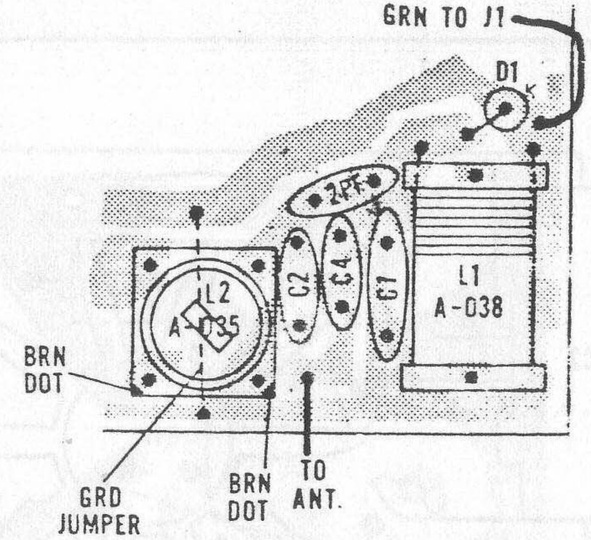
TITLE PARTS LOCATION RF 73A TRANSMITTER

NO B-656

72 MHZ




53 MHZ




| | 72 MHZ** | 53 MHZ |
|---|---|---|
| C1 | —— | 20PF |
| C2 | 12PF | 12PF |
| C3 | 12PF | 20PF |
| C4 | NOTE 4 | NOTE 4 |
| C5 | 2PF | 6.8PF |
| L1 | —— | A-038 |
| L2 | A-024 | A-035 |
| L3 | A-036 | A-035 |
| L4 | .82UH | 4.7UH |
| R1 | 100Ω | 1KΩ |
| R2 | *2.2K | 470Ω |
| R3 | *2.2K | 1.0K |
| X1 | X-015 | X-016 |
| X2 | X-017 | X-017 |

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q6 Q7 Q9 Q10 ARE X32B4079 (Q-025).
   Q1 THRU Q5 ARE 16G4200 (Q-018).
   Q8 IS 34A1165 (Q-026).
3. DIODES D1 AND D2 ARE DA2208 (D-001).
   D3 IS 3.3V ZENER 1N746-A (D-005).
4. CONNECT A JUMPER WIRE BETWEEN LANDS IN PLACE OF CAPACITOR C4 FOR 53 AND 72 mHz, OR CONNECT ANTENNA WIRE DIRECTLY TO ANTENNA COIL LAND.

**FOR 75 mHz C1 IS 10pf, C2 IS 6.8pf, C3 IS 10pf.

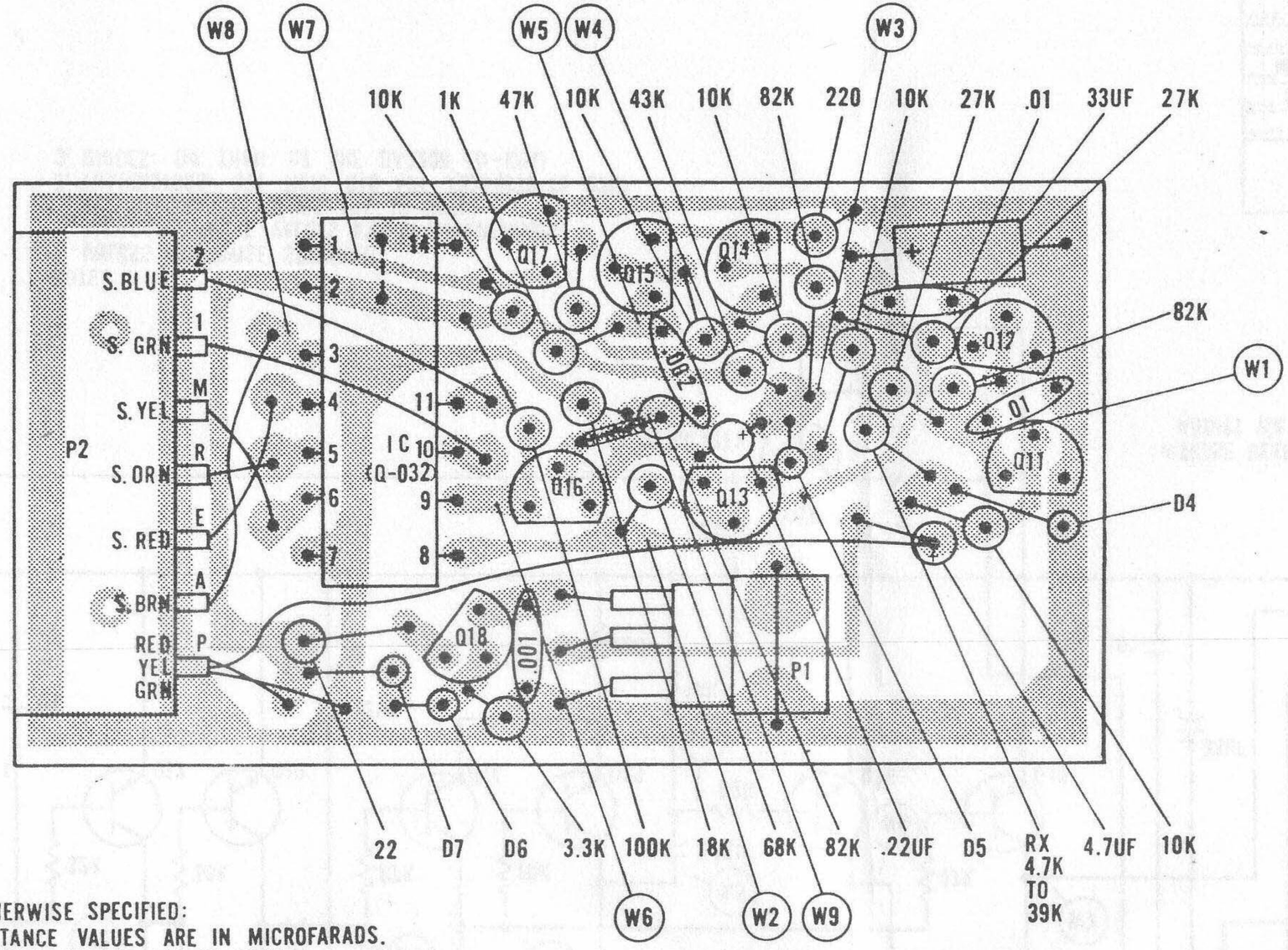
*THESE RESISTOR VALUES MAY BE CHANGED TO ADJUST VOLTAGES SPECIFIED.

E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST TEXAS 76053

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 7-19-73 | ADDED NOTE 4 & 75 mHz NOTE | DB | 4-24-74 |
| DR'N MWP CKD | | | |
| APVD | | | |

TITLE PARTS LOCATION: 6 CHANNEL SUPER-PRO RECEIVER 72B

B-657




NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.

2. TRANSISTORS: Q11 THRU Q18 ARE X32B4079 (Q-025).

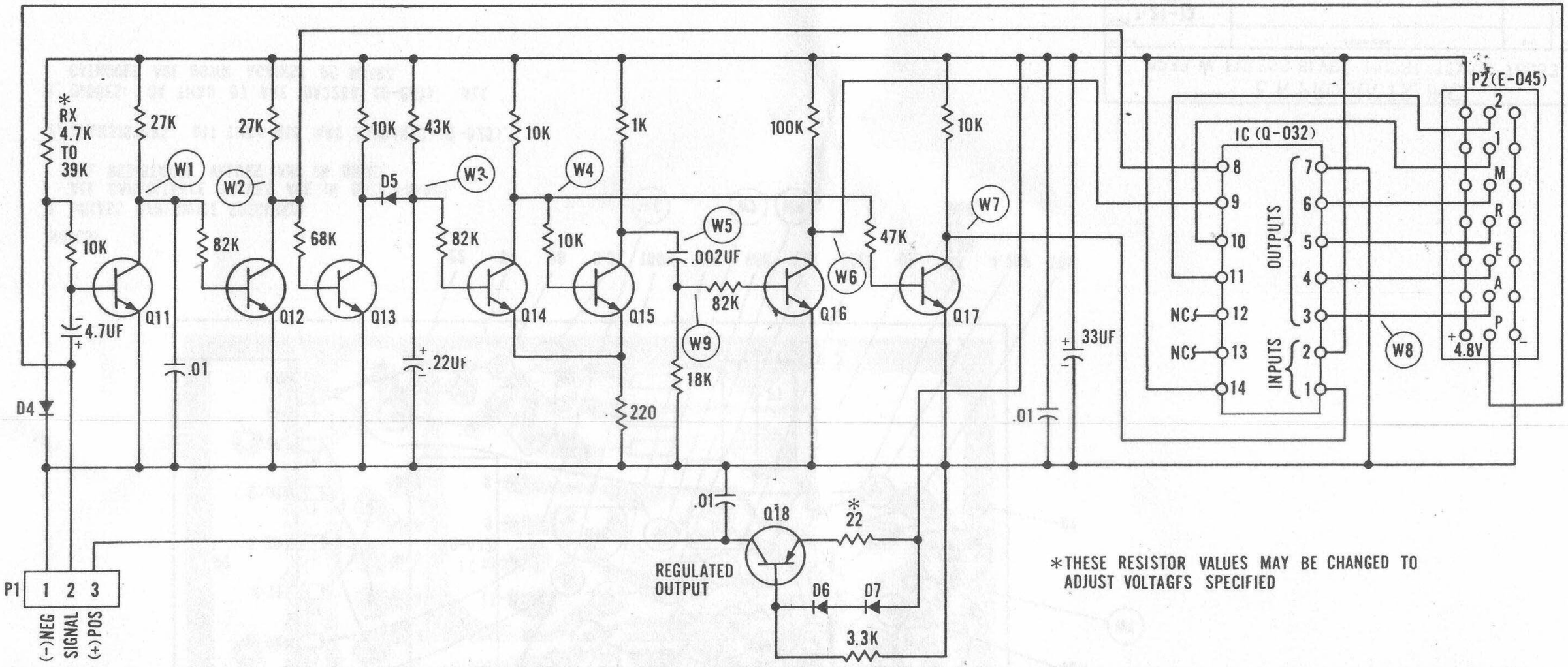
3. DIODES: D4 THRU D7 ARE DA2208 (D-001). ALL CATHODES ARE DOWN AGAINST PC BOARD.

E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST TEXAS 76053

| SCALE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 7-24-73 | | | |
| DR'N MWP CKD | | | |
| APVD | | | |

TITLE PARTS LOCATION: 6 CH IC DECODER FOR SUPER—PRO AND CHAMP RECEIVERS

NO. B-658




*THESE RESISTOR VALUES MAY BE CHANGED TO ADJUST VOLTAGFS SPECIFIED

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q11 THRU Q18 ARE X32B4079 (Q-025).
3. DIODES: D4 THRU D7 ARE DA2208 (D-001).

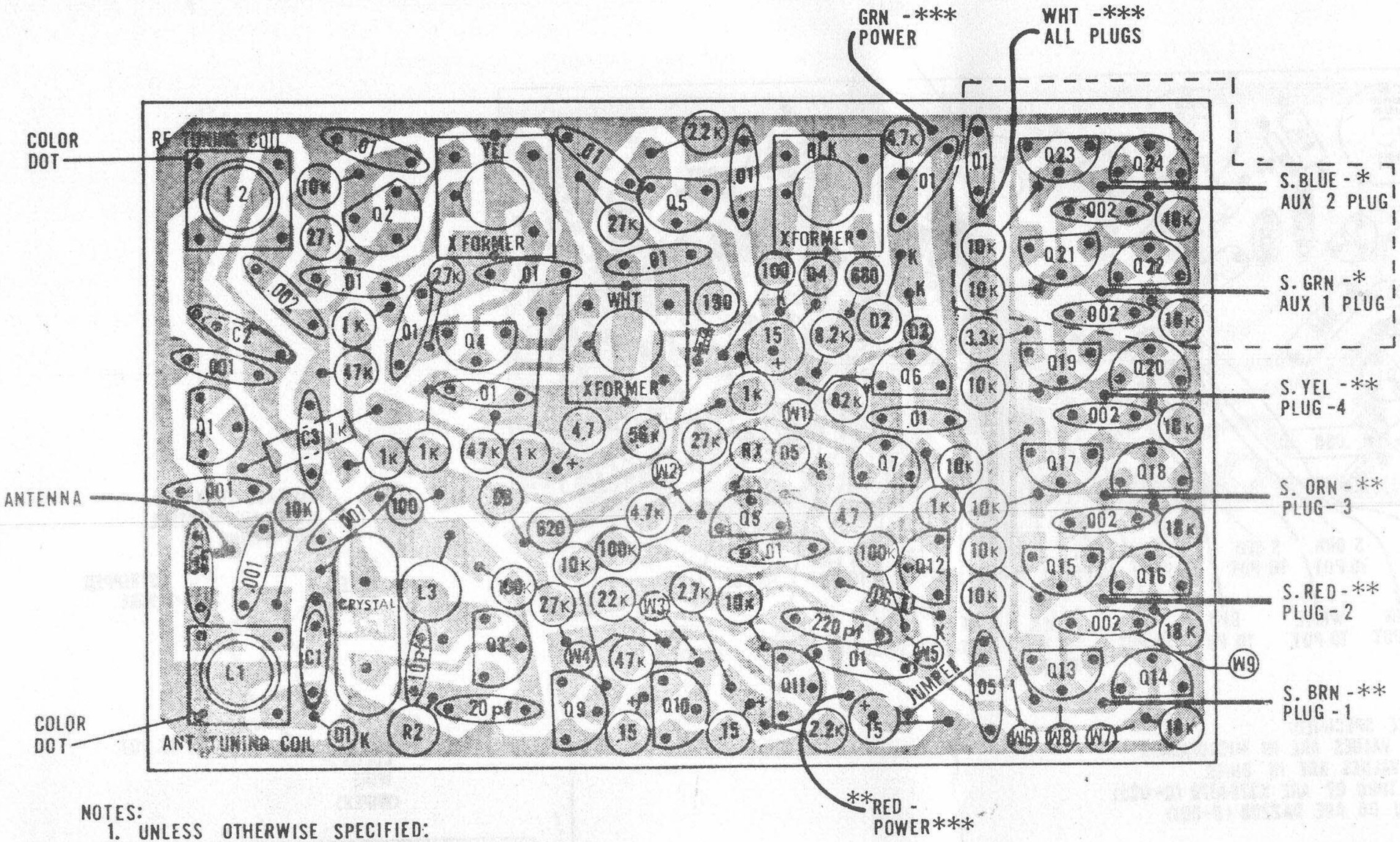
E K PRODUCTS, INC.
1233 W. EULESS BLVD., HURST, TEXAS 76053

| SCALE NONE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 8-7-73 | | | |
| DR'N MWP CKD. | | | |
| AP'VD. | | | |

TITLE CIRCUIT DIAGRAM — 6 CH. I.C. DECODER FOR SUPER — PRO AND CHAMP REC.

NO. B-664

BRUNING 40-105




*ON LOGICTROL 4-CHANNEL AND CHAMPION 4 RECEIVERS THESE COMPONENTS AND WIRES ARE EXCLUDED.

**TO AMP DECK - CHAMPION MODEL ONLY.

***LOGICTROL 4 AND 6 CHANNEL RECECEIVER CONNECTOR-WIRES ARE SPLICED TO ALL CHANNELS.

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q1-Q5 ARE X32N4200 (Q-029).
   Q6-Q12, Q14, Q16, Q18, Q20, Q22, Q24, ARE X32B4079 (Q025).
   Q13, Q15, Q17, Q19, Q21, Q23, ARE X34A1165 (Q026).
3. DIODES: D1, D3, D5, D6 ARE DA2208 (D001).
   D2 IS IN60 (D002).
   D4 IS IN746-A (D005).
4. RX: VARIABLE- 4.7K TO 27K.

REF. DWG. B-540

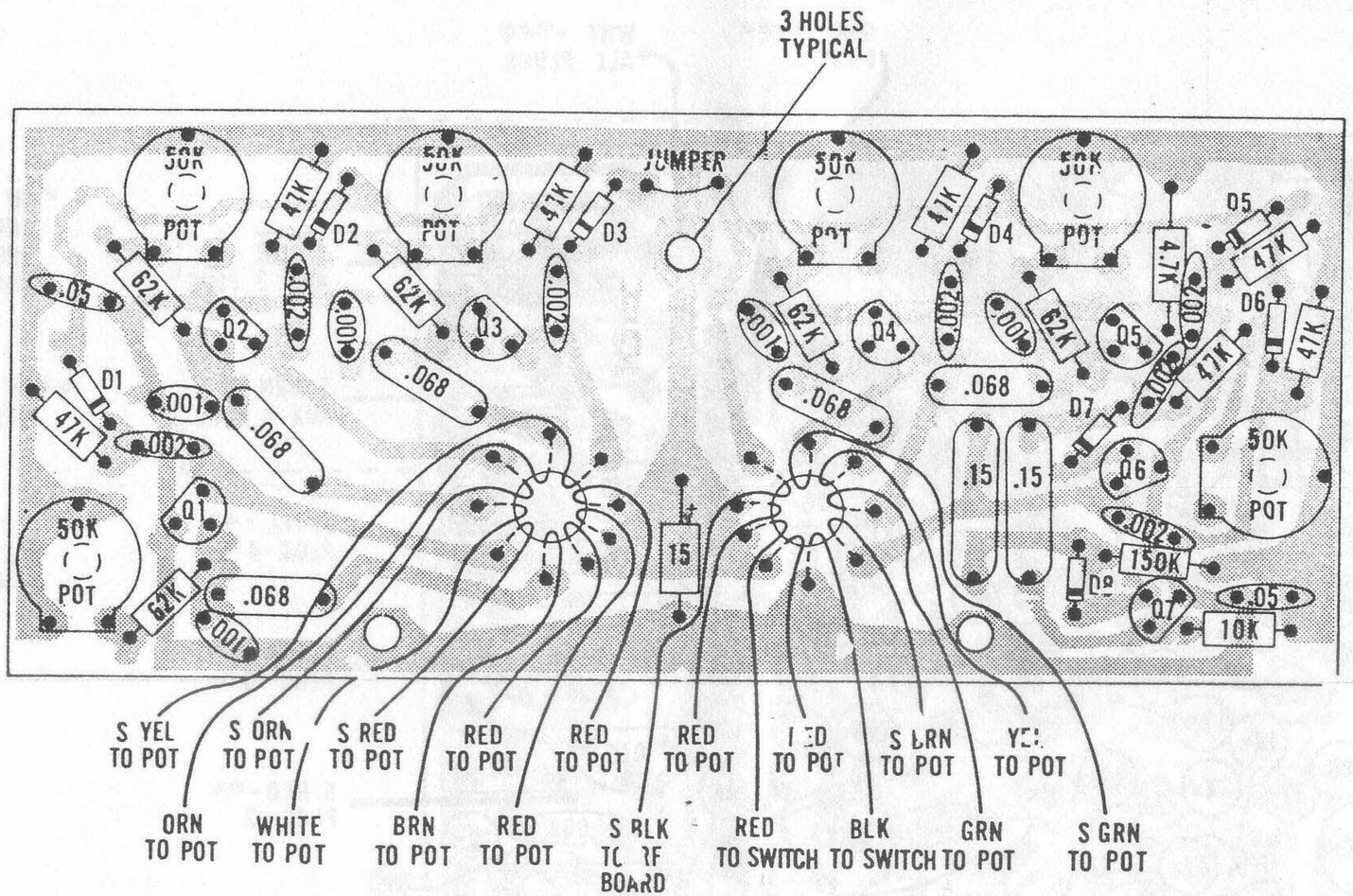
| | 27 MHZ | 53 MHZ | 72 MHZ |
|---|---|---|---|
| C1 | 33pf | 22pf | 12pf |
| C2 | 33pf | 20pf | 10pf |
| C3 | 10pf | 6.8pf | 1.0pf |
| C4 | 10pf | .001uf | .001uf |
| L3 | 10uH | 4.7uH | .82uH |
| R2 | 1K | 1K | 100Ω |

E K PRODUCTS, INC.
2233 W. EULESS BLVD., EULESS, TEXAS 76053

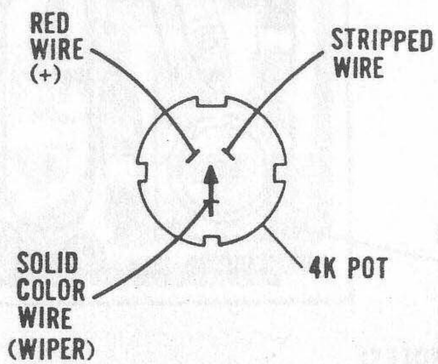
| SCALE NONE | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 2-5-74 | | | |
| DR N BD / CKD | | | |
| AP VD | | | |

TITLE PARTS LOCATION: 70 LOG. AND CHAMP. 4-6 CHANNEL RECEIVER (R-8)

NO B-673




CONTROL STICK AND
AUXILLARY CONTROL
POT WIRING




NOTES:

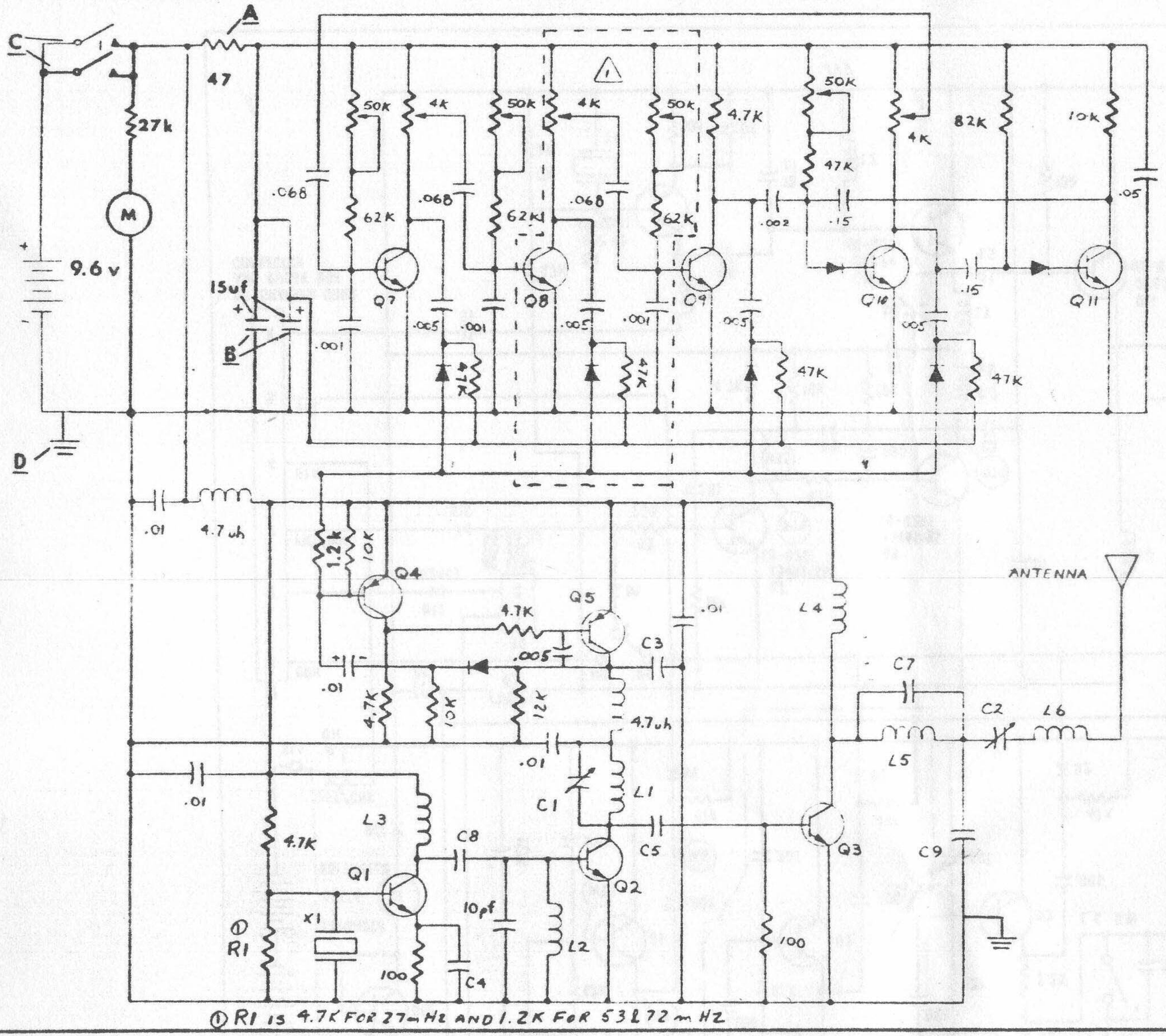
1. UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
   ALL RESISTANCE VALUES ARE IN OHMS.
2. TRANSISTORS: Q1 THRU Q7 ARE X32B4079 (Q-025).
3. DIODES: D1 THRU D8 ARE DA2208 (D-001).

E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST, TEXAS 76053

| SCALE 2 TO 1 | REVISIONS | BY | DATE |
|---|---|---|---|
| DATE 9-14-73 | | | |
| DR'N MWP CKD. | | | |
| APV'D. | | | |

TITLE
PARTS LOCATION: 74 CHAMPION XMTR
5 CHANNEL ENCODER BOARD

NO. B-667

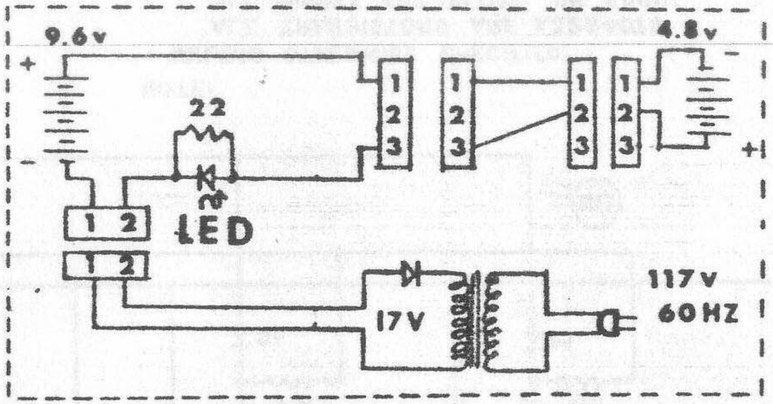



① R1 IS 4.7K FOR 27-MHz AND 1.2K FOR 53 & 72 mHz

| | 27 mhz | 6 meter | 72 mhz |
|---|---|---|---|
| C1 | ARCO 404 | ARCO 404 | ARCO 403 |
| C2 | ARCO 402 | ARCO 402 | ARCO 402 |
| C3 | .01 uf | .047 uf | .047 uf |
| C4 | 68 pf | 33 pf | 33 pf |
| C5 | 33 pf | 20 pf | 20 pf |
| C6 | OMITTED | OMITTED | OMITTED |
| C7 | 47 pf | 10 pf | 6.8 pf |
| C8 | 10 pf | 10 pf | 6.8 pf |
| C9 | 33 pf | 20 pf | 15 pf |
| L1 | .68 uh | .22 uh | 6 TURNS #20 ⅜ ID |
| L2 | 100 Ω RES. | 4.7 uh | 4.7 uh |
| L3 | 1.5 uh | .68 uh | .33 uh |
| L4 | 22 uh | 4.7 uh | 4.7 uh |
| L5 | .15 uh | .22 uh | .22 uh |
| L6 | 4.7 uh | 1.5 uh | .68 uh |

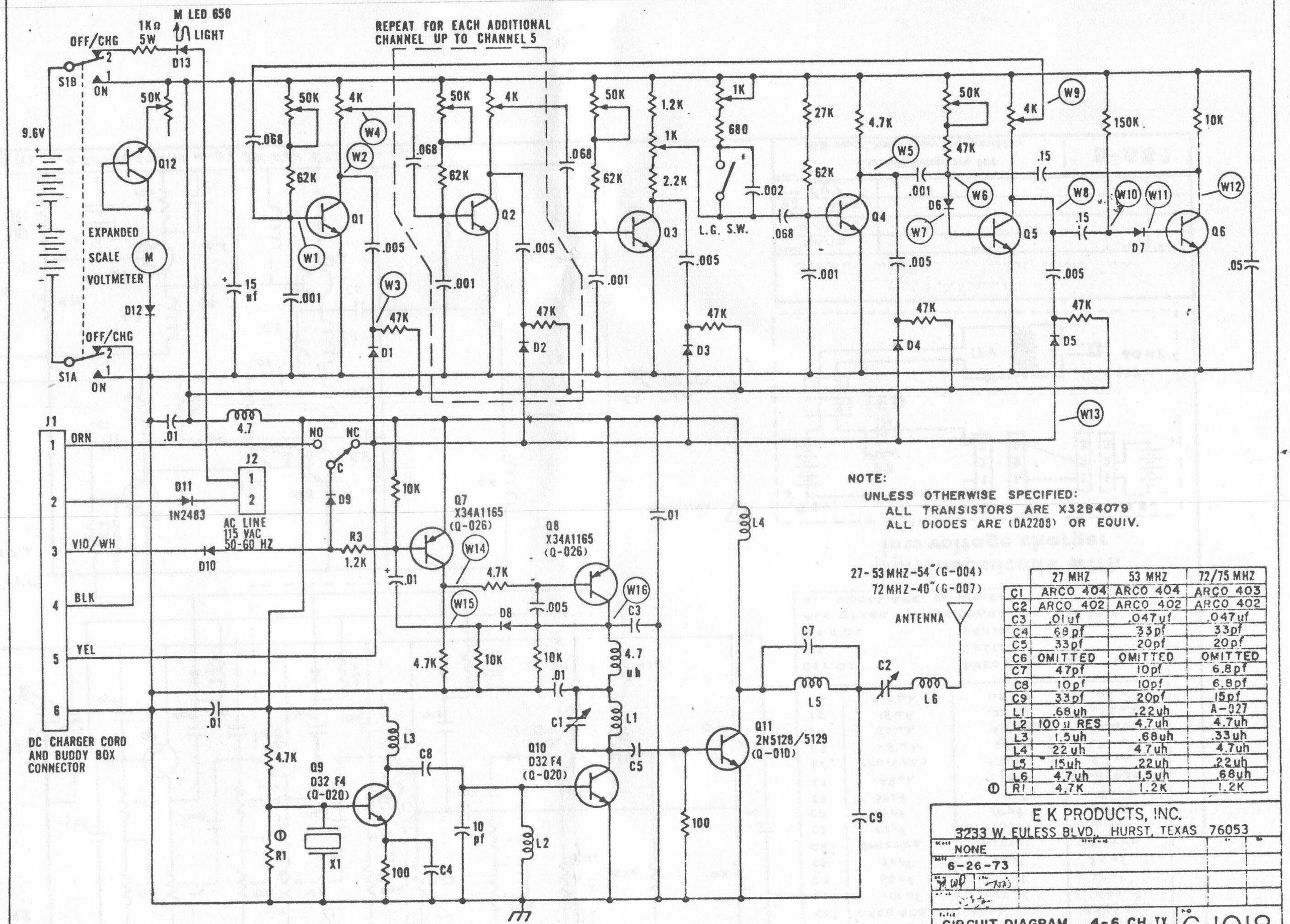
Q1 & Q2 2N5030 OR DA32-FA *
Q3 2N5128
Q4 & Q5 34A1165
ALL OTHER TRANSISTORS ARE 3284079
ALL DIODES ARE GE 1N4154

## Optional nicads with low voltage charger




E.K. PRODUCTS INC.
3235 [illegible], HOUSTON, TEXAS [illegible]

| | | | |
|---|---|---|---|
| SCALE none | REVISIONS | BY | DATE |
| DATE 4-27-76 | | | |
| DR'N SJ / CKD DDD | | | |
| APV'D. RYE | | | |
| TITLE Circuit Diagram for LRB and Champion Transmitter | | NO. B-681 | |




NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL TRANSISTORS ARE X32B4079
ALL DIODES ARE (DA2208) OR EQUIV.

| | 27 MHZ | 53 MHZ | 72/75 MHZ |
|---|---|---|---|
| C1 | ARCO 404 | ARCO 404 | ARCO 403 |
| C2 | ARCO 402 | ARCO 402 | ARCO 402 |
| C3 | .01uf | .047uf | .047uf |
| C4 | 68pf | 33pf | 33pf |
| C5 | 33pf | 20pf | 20pf |
| C6 | OMITTED | OMITTED | OMITTED |
| C7 | 47pf | 10pf | 6.8pf |
| C8 | 10pf | 10pf | 6.8pf |
| C9 | 33pf | 20pf | 15pf |
| L1 | .68uh | .22uh | A-027 |
| L2 | 100Ω RES | 4.7uh | 4.7uh |
| L3 | 1.5uh | .68uh | .33uh |
| L4 | 22uh | 4.7uh | 4.7uh |
| L5 | .15uh | .22uh | .22uh |
| L6 | 4.7uh | 1.5uh | .68uh |
| ① R1 | 4.7K | 1.2K | 1.2K |

E K PRODUCTS, INC.
3233 W. EULESS BLVD., HURST, TEXAS 76053

SCALE NONE
DATE 6-26-73

CIRCUIT DIAGRAM 4-6 CH. TX
73 LOG. SUPER-PRO & CHAM.

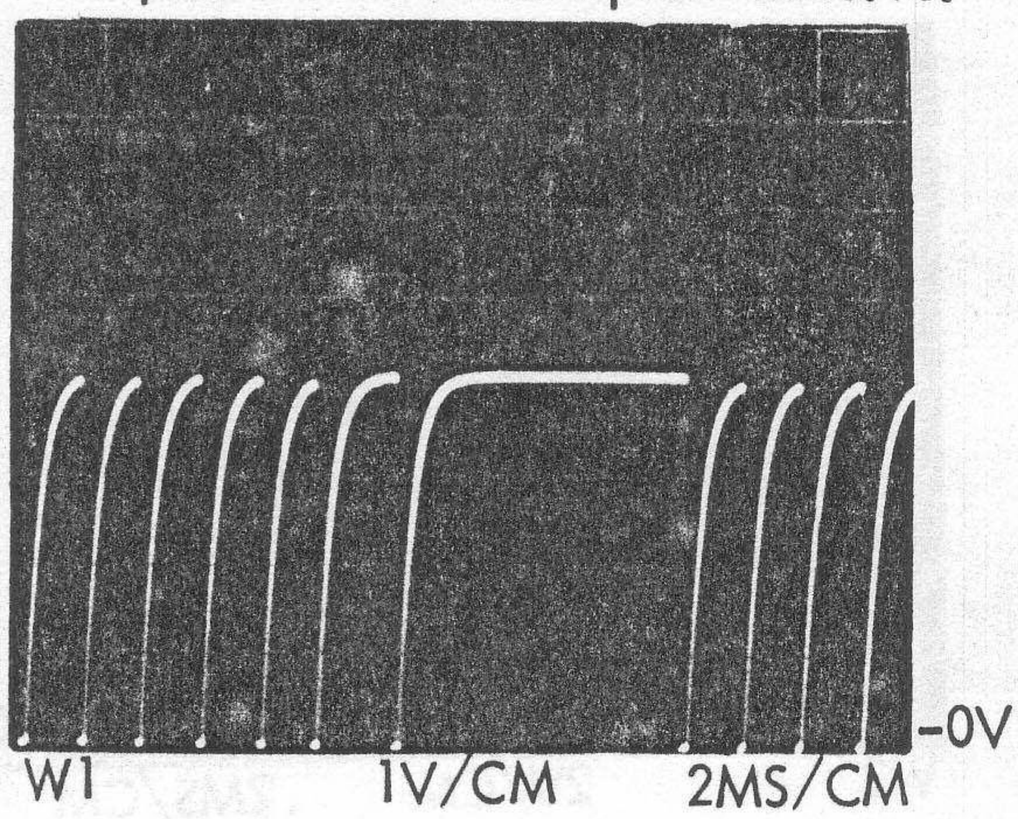
NO C-1018

W-B-664

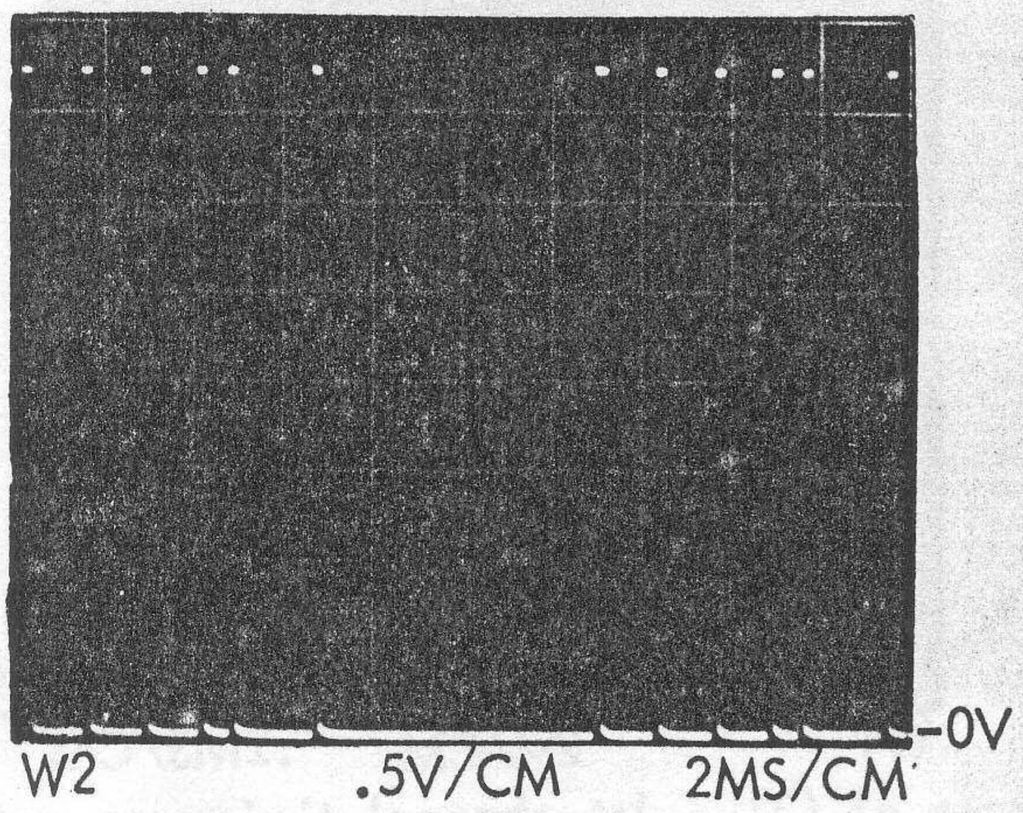
# WAVE FORMS

6 Channel I.C. Decoder for 1972-73 Super Pro and Champion Receiver

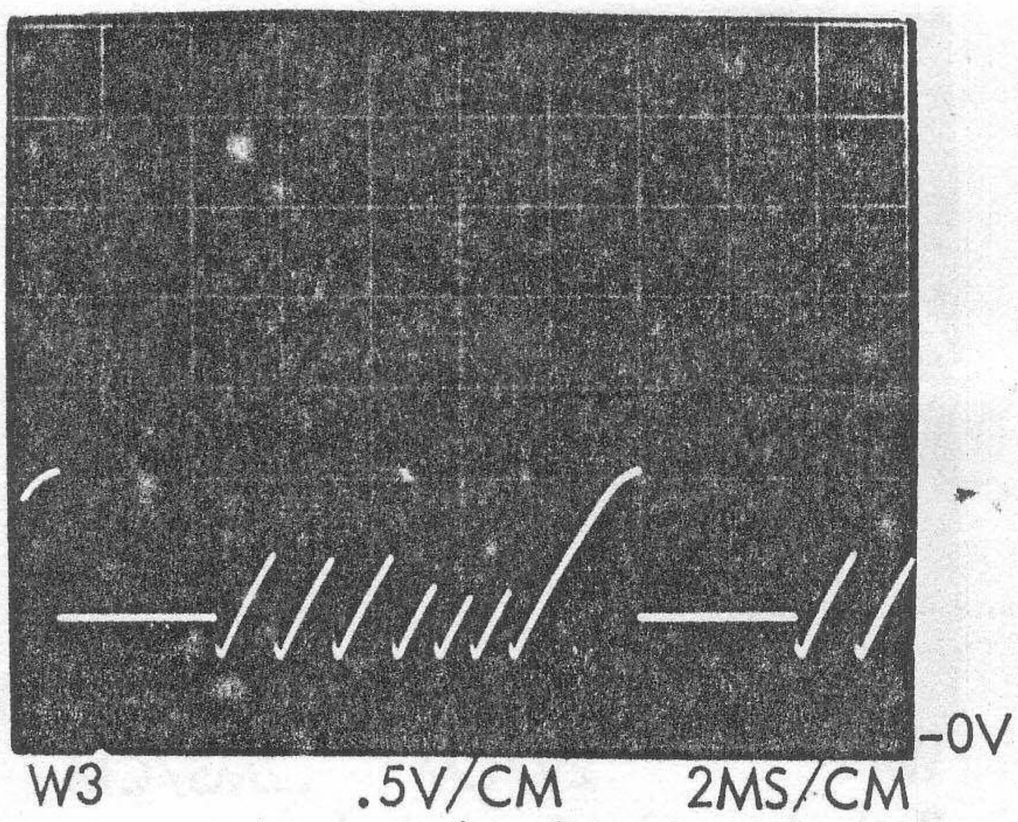
REFERENCE DRAWINGS B-658 & 664



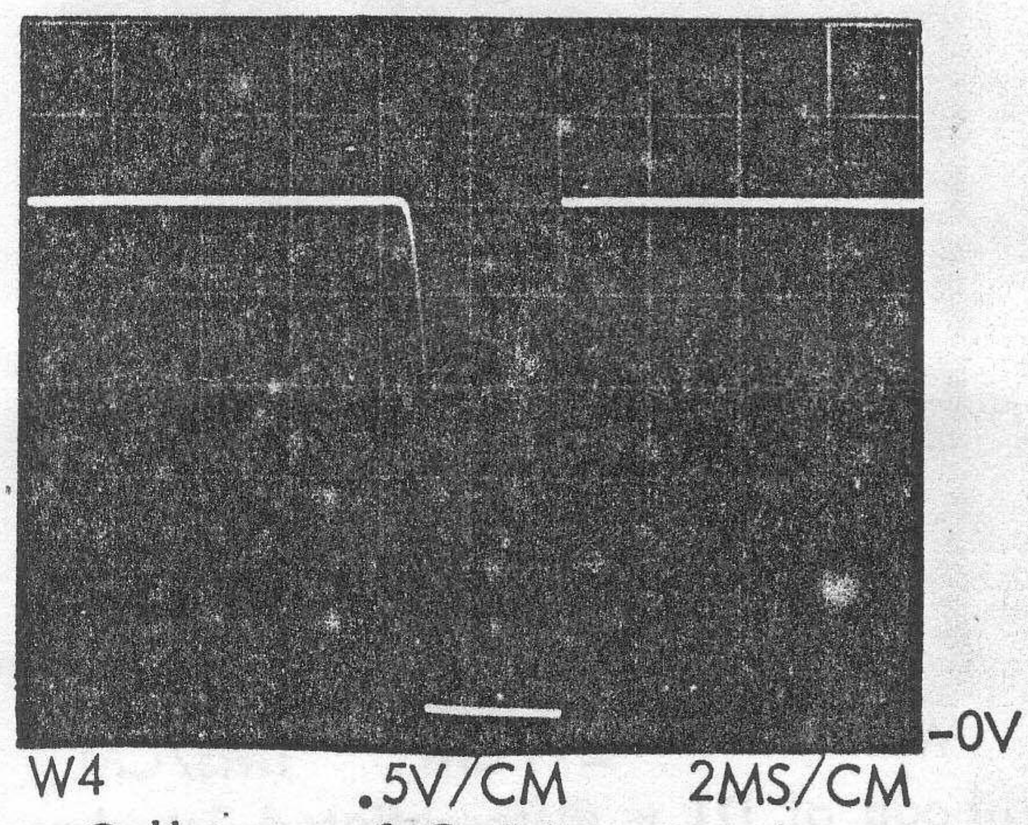

Collector of Q-11 - Pulse Amp. with strong signal.



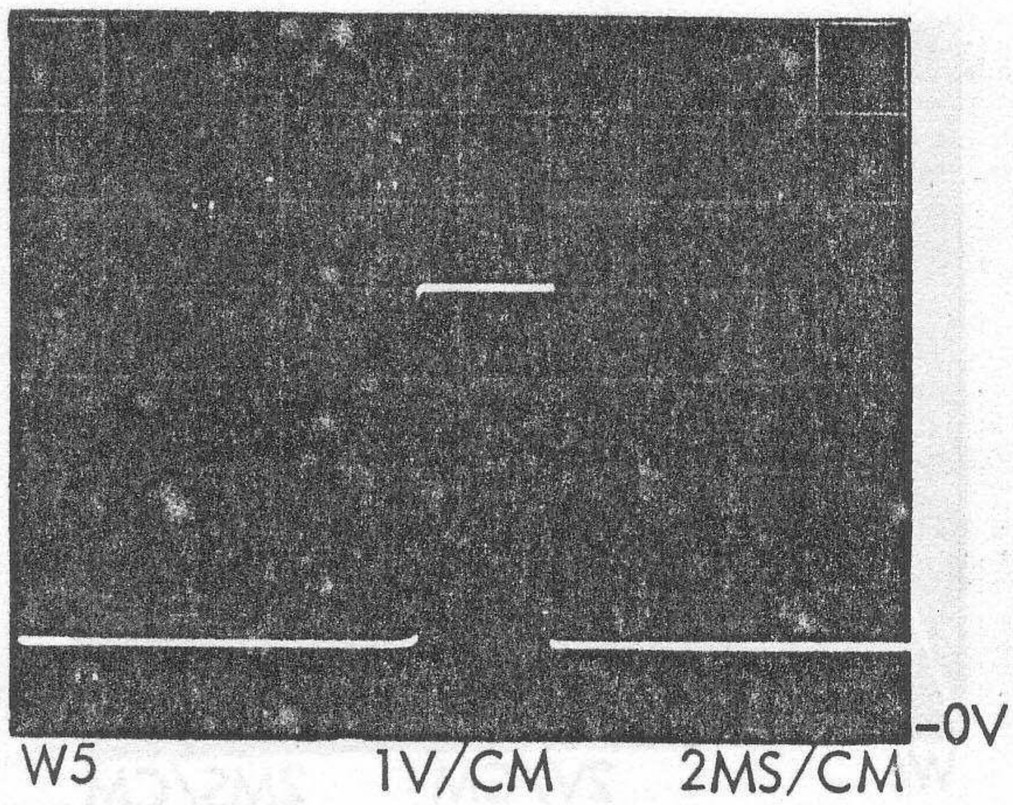

Collector of Q-12- Clock pulse to shift register.



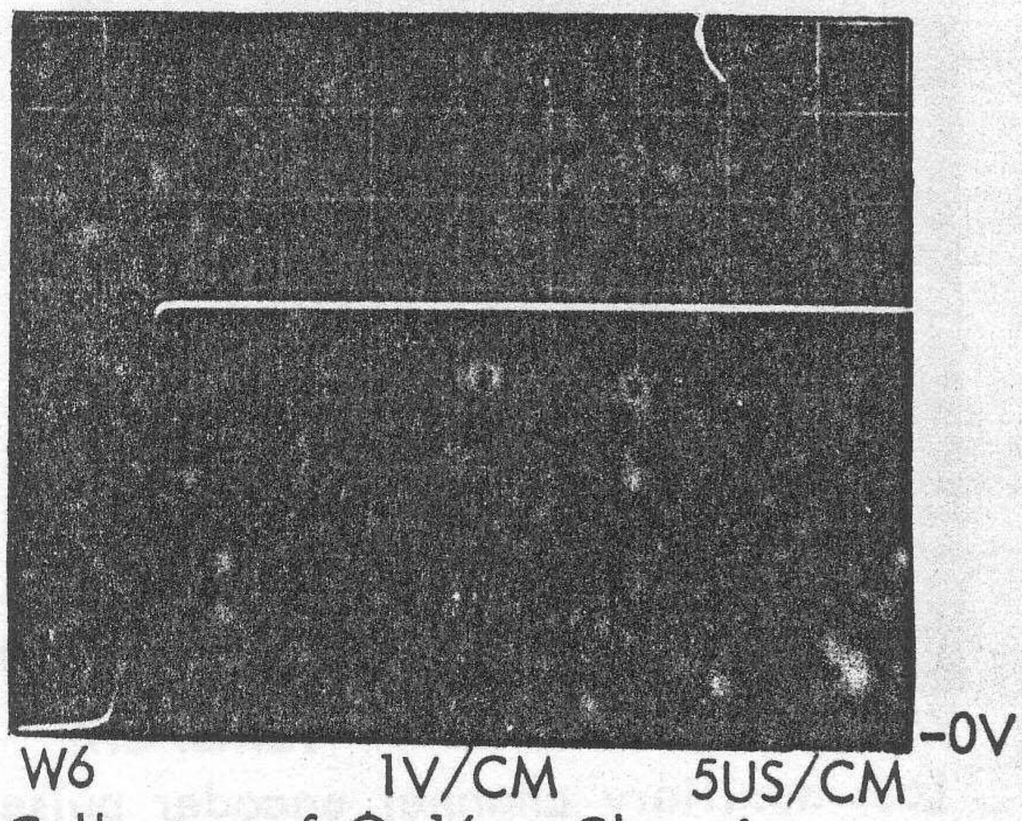

Anode of D-5 - Input to Schmitt trigger.




Collector of Q-14 - signal to inverter Q17.



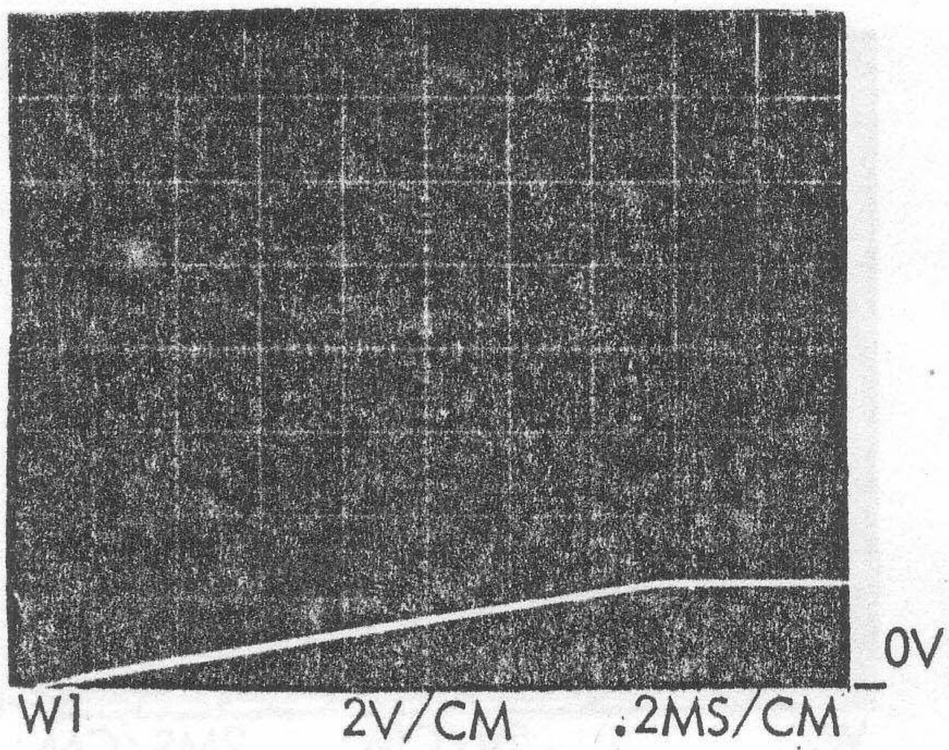

Collector of Q-15 - Schmitt Trigger output.



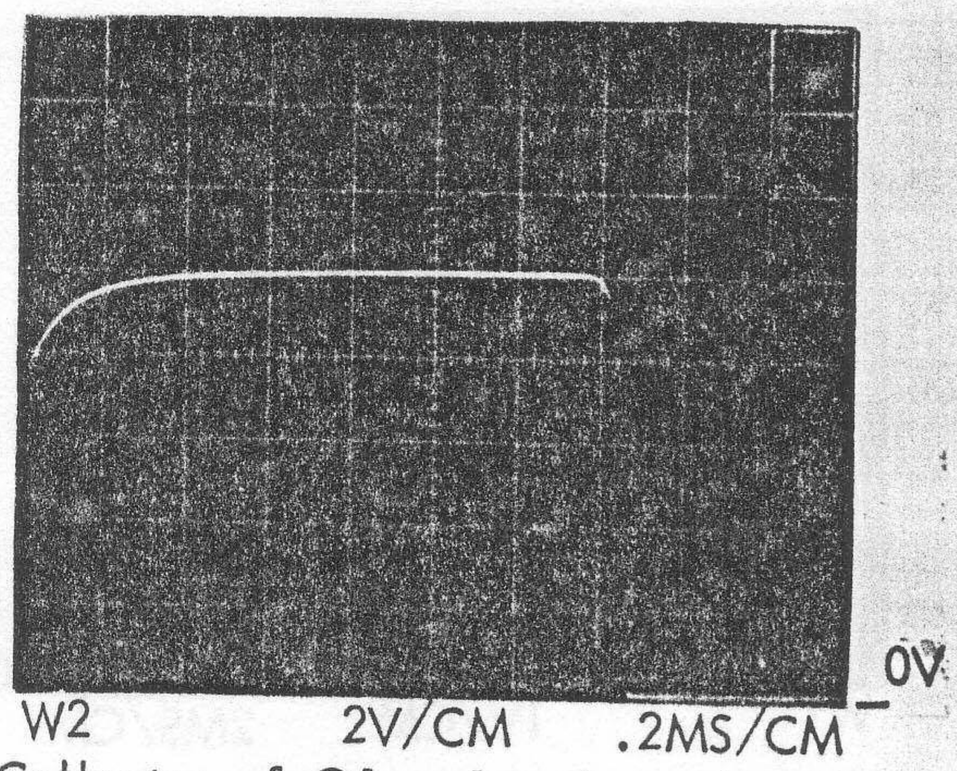

Collector of Q-16 - Clear input waveform to shift register.

W-C-1018
WAVE FORMS

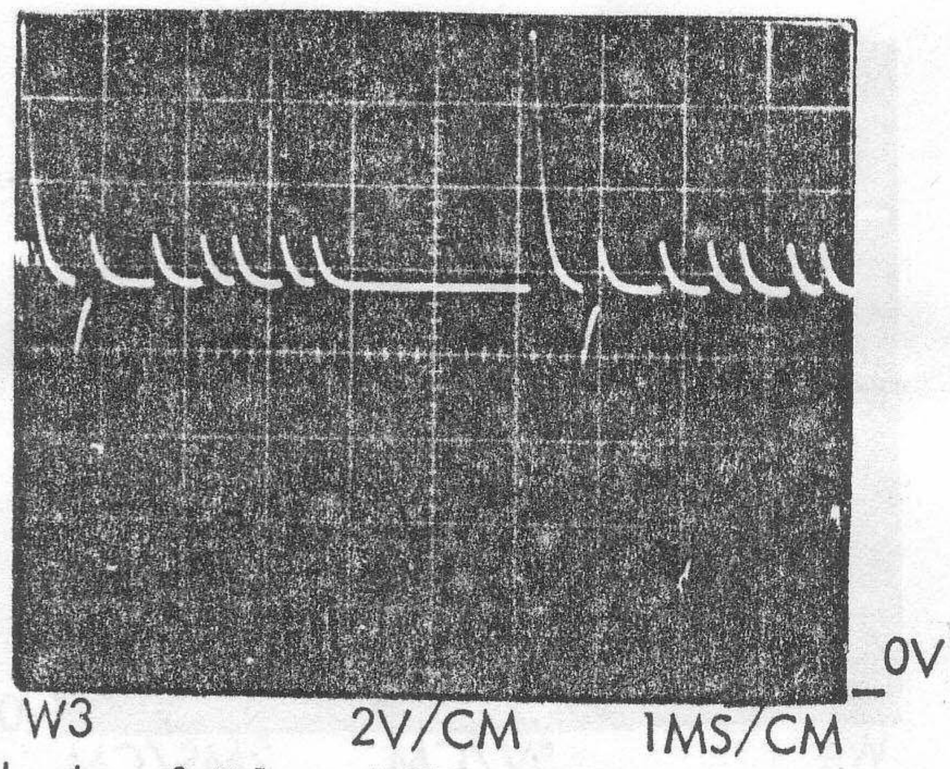
1973 CHAMP. AND SUPER PRO TRANSMITTER REFERENCE DRAWINGS - C-1018, B-654, B-656



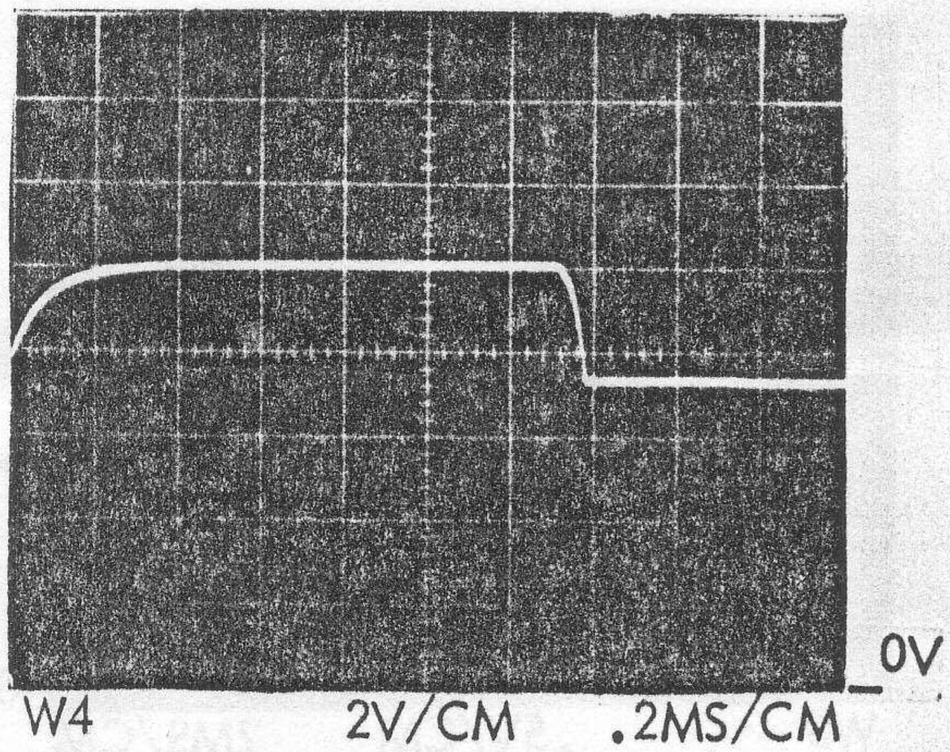

Base of Q1 - 1st channel timing capacitor (.068 mfd) discharge curve.



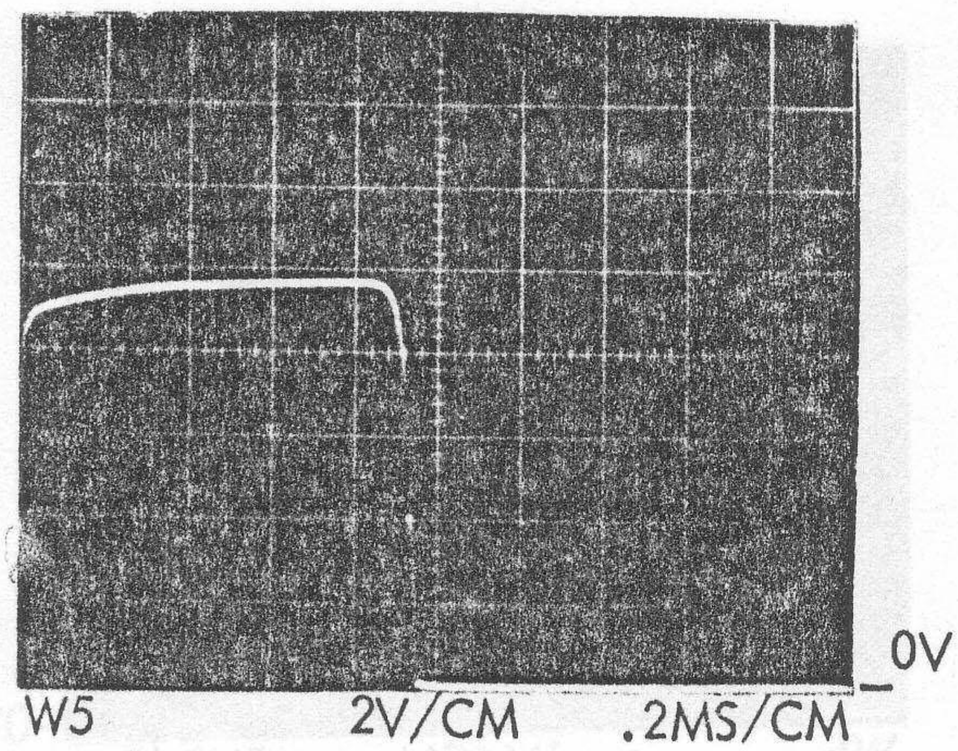

Collector of Q1 - 1st channel Encoder pulse.



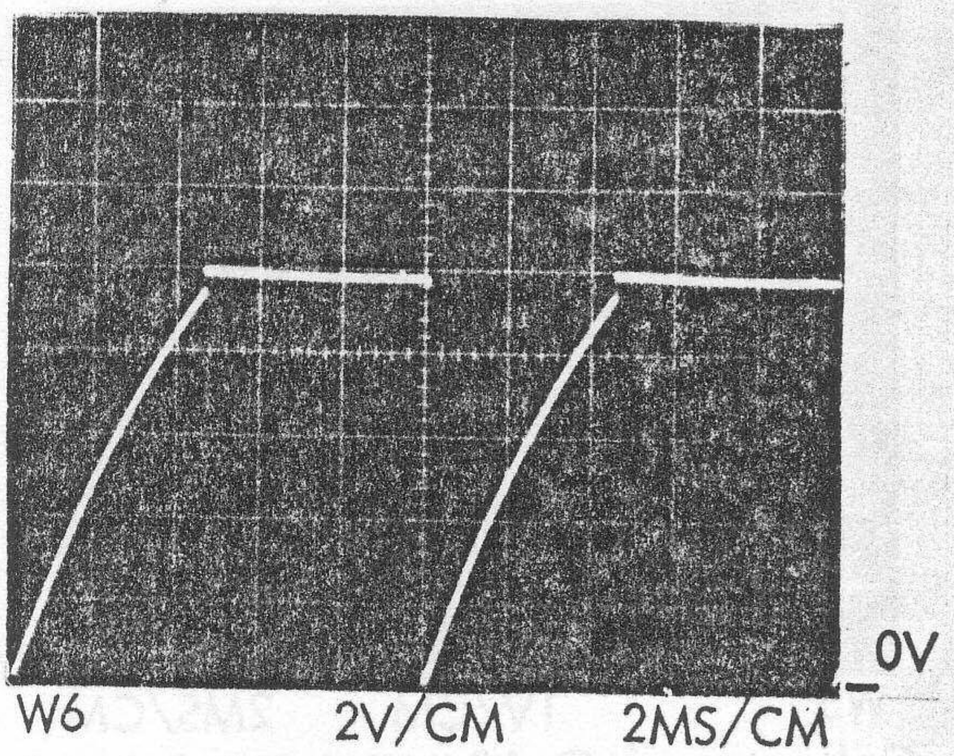

Cathode of D1 - differentiated 1st channel pulse.



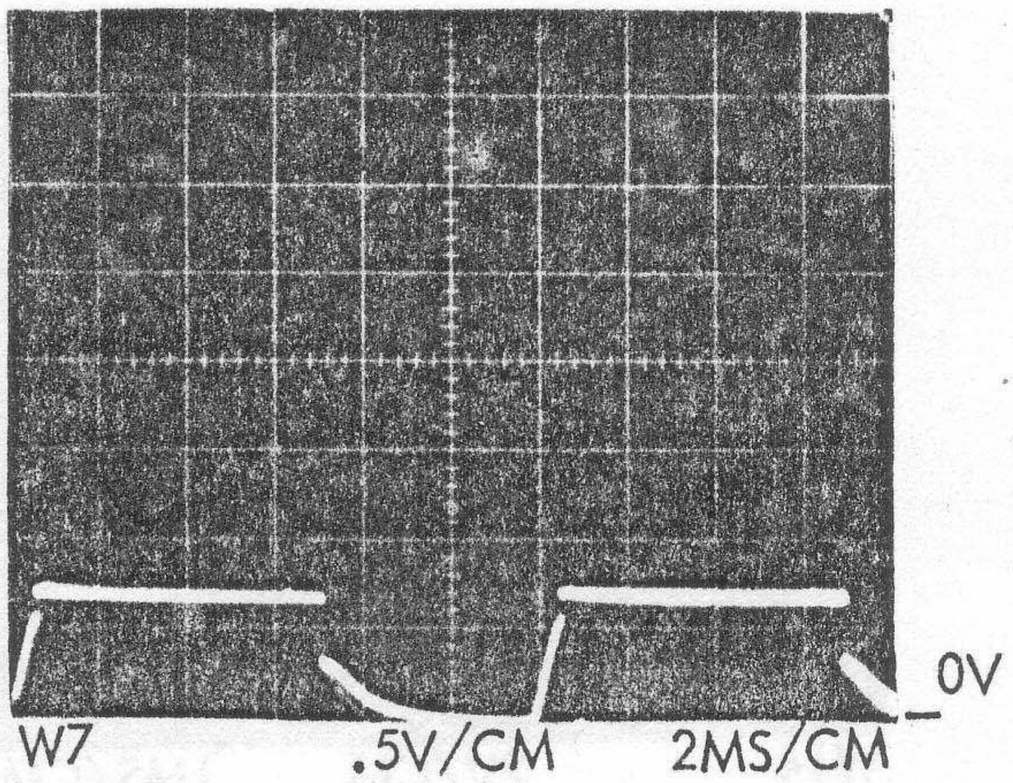

2nd channel trigger pulse.



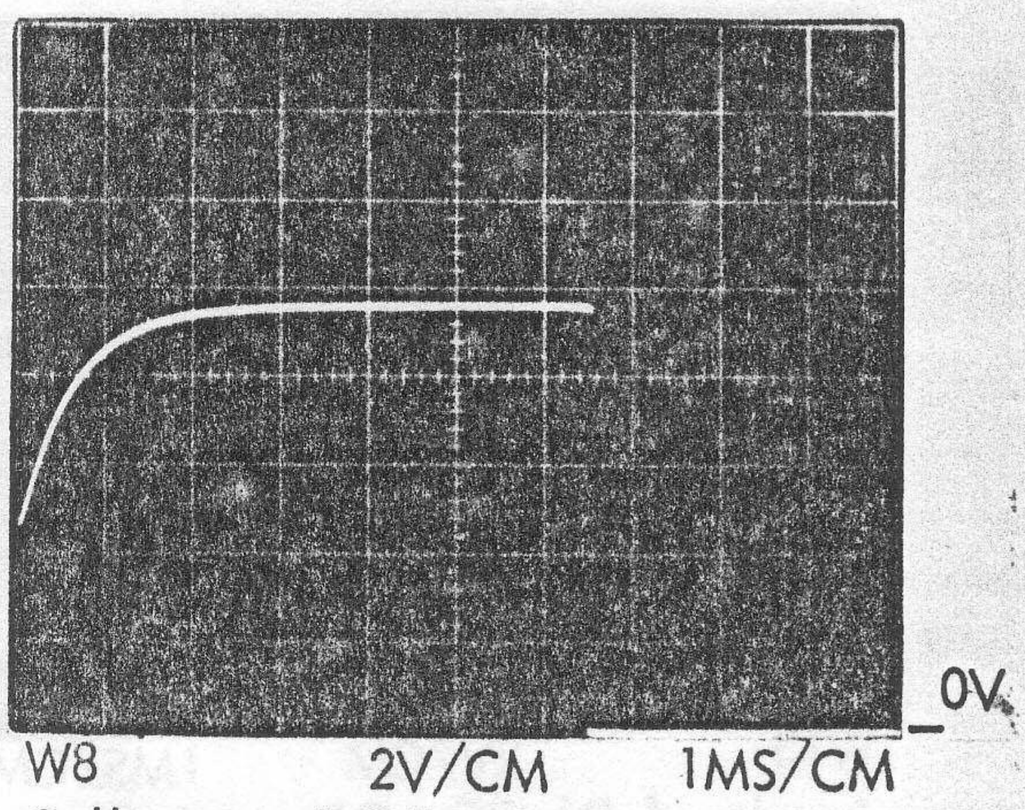

Last auxiliary channel encoder pulse.



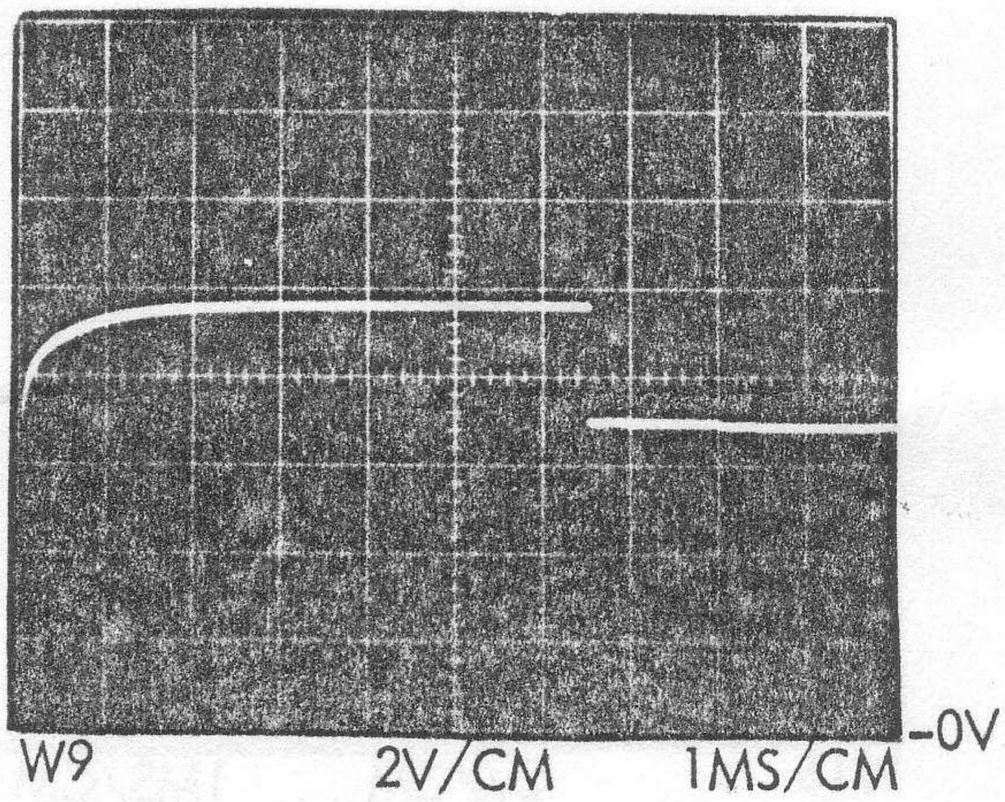

Anode of D6 - discharge of timing capacitor (.15 mfd) connected to collector of Q6.



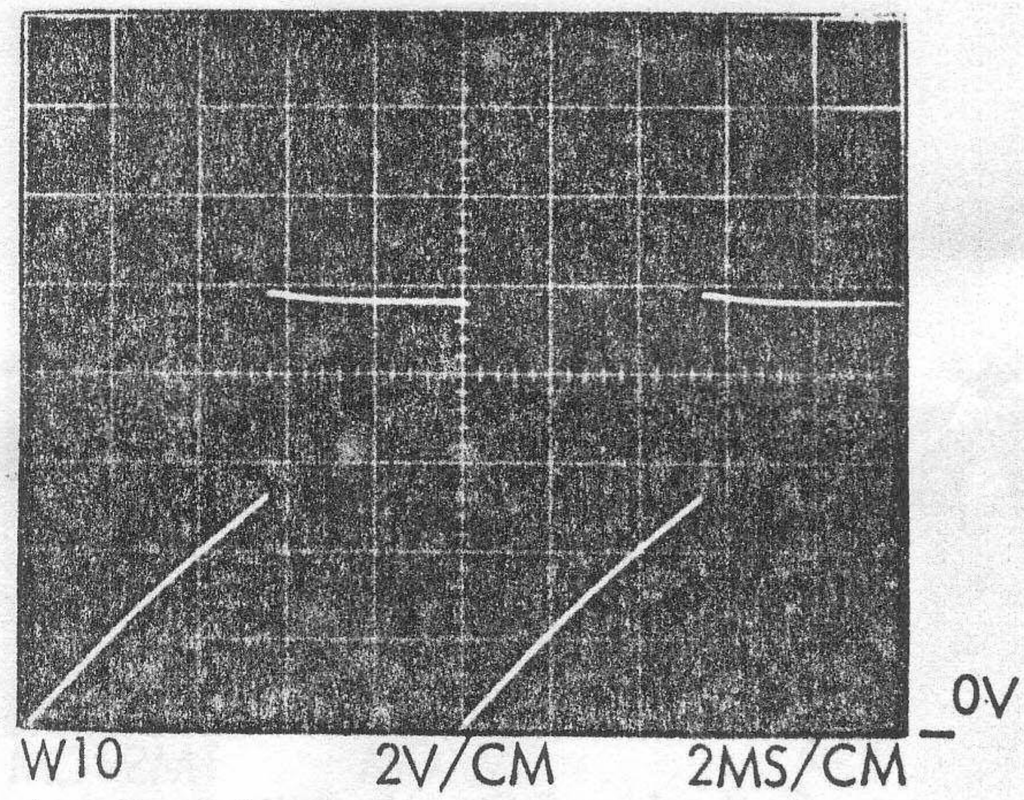

Base of Q5 - timing pulse of reset circuit.



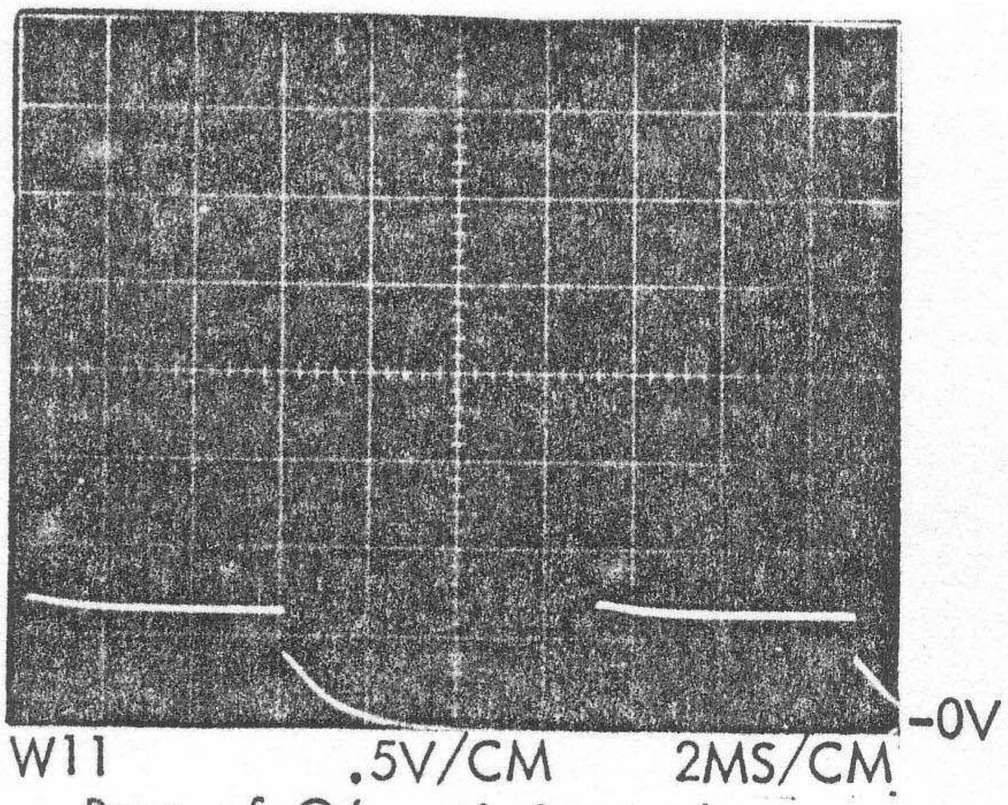

Collector of Q5 - reset pulse (6.5ms).



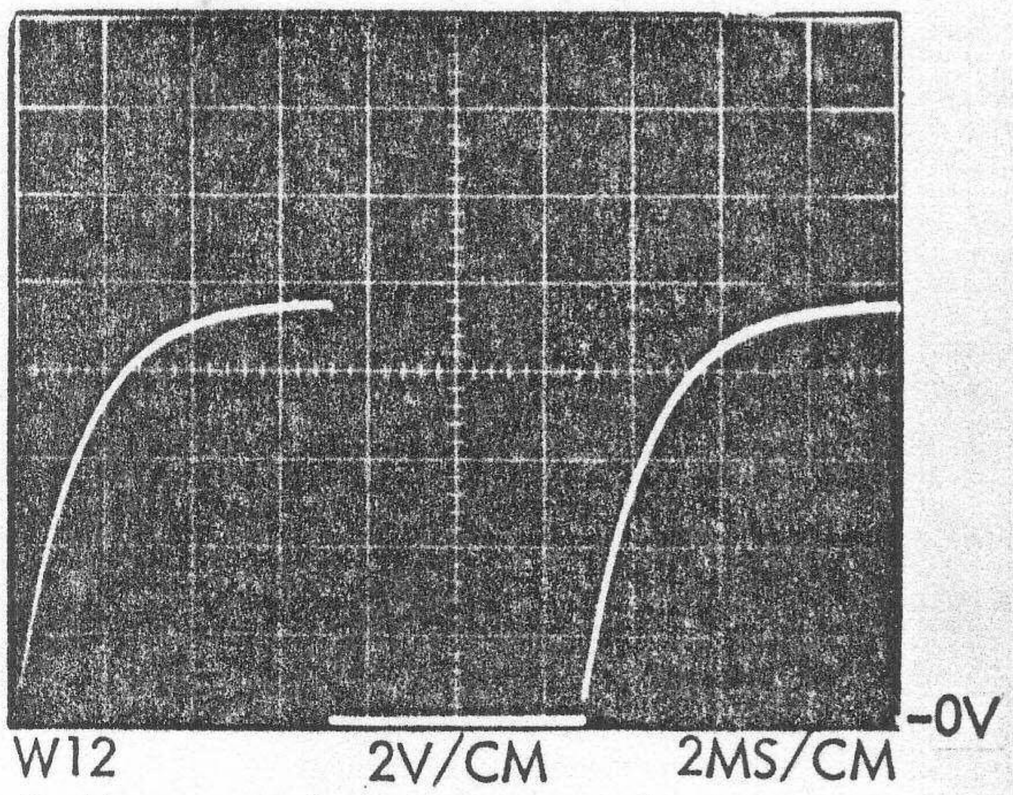

1st Channel trigger pulse



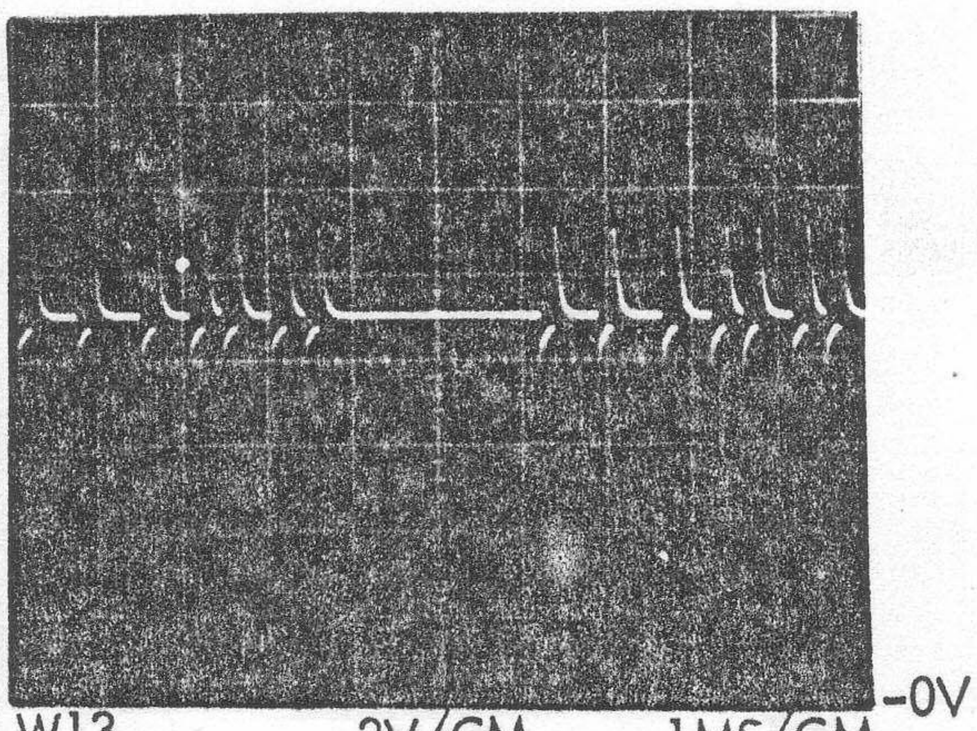

Anode of D7 - discharge of timing capacitor (.15 mfd) connected to collector of Q5.




Base of Q6 - timing pulse.

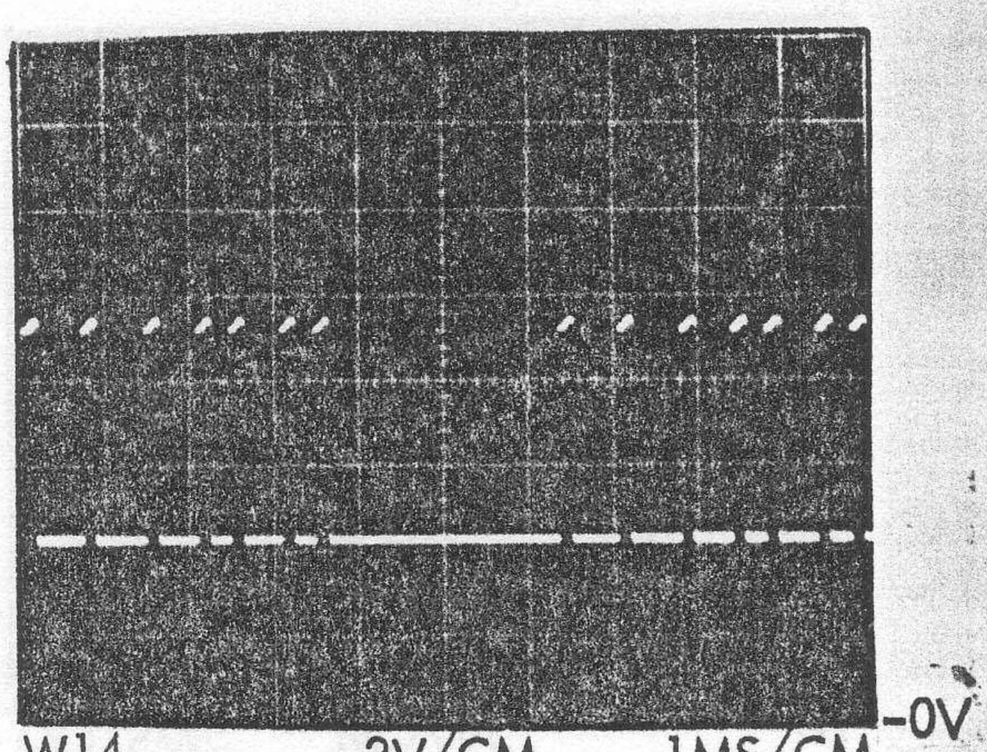



Collector of Q6 - complementary timing pulse of reset circuit.



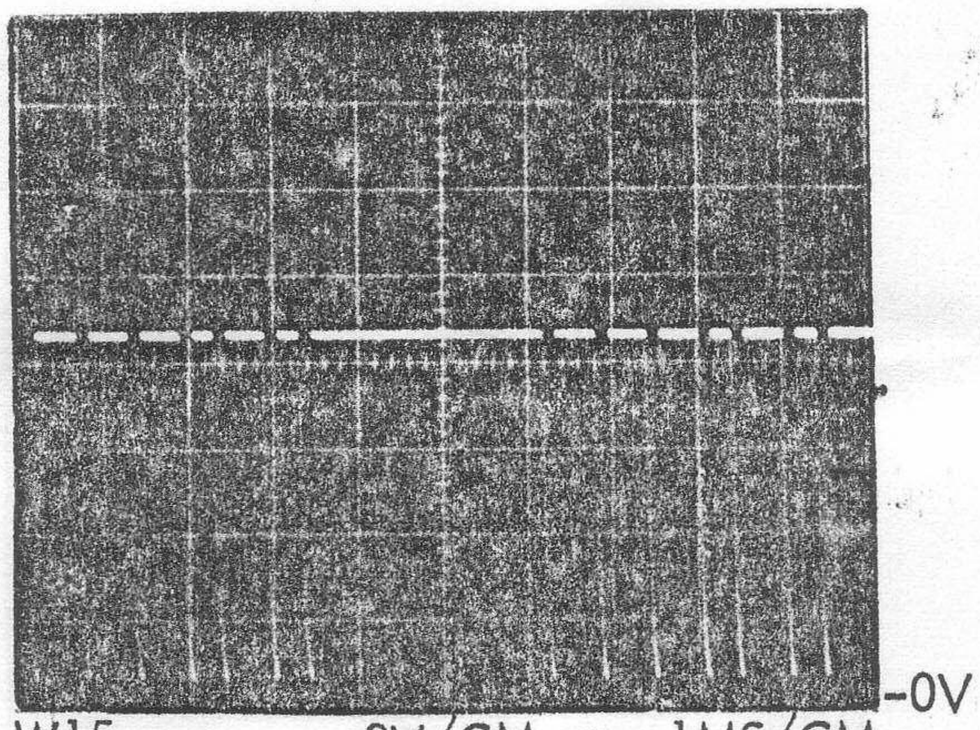

W13 2V/CM 1MS/CM

Anode of D1-D5, OR gate signal line.



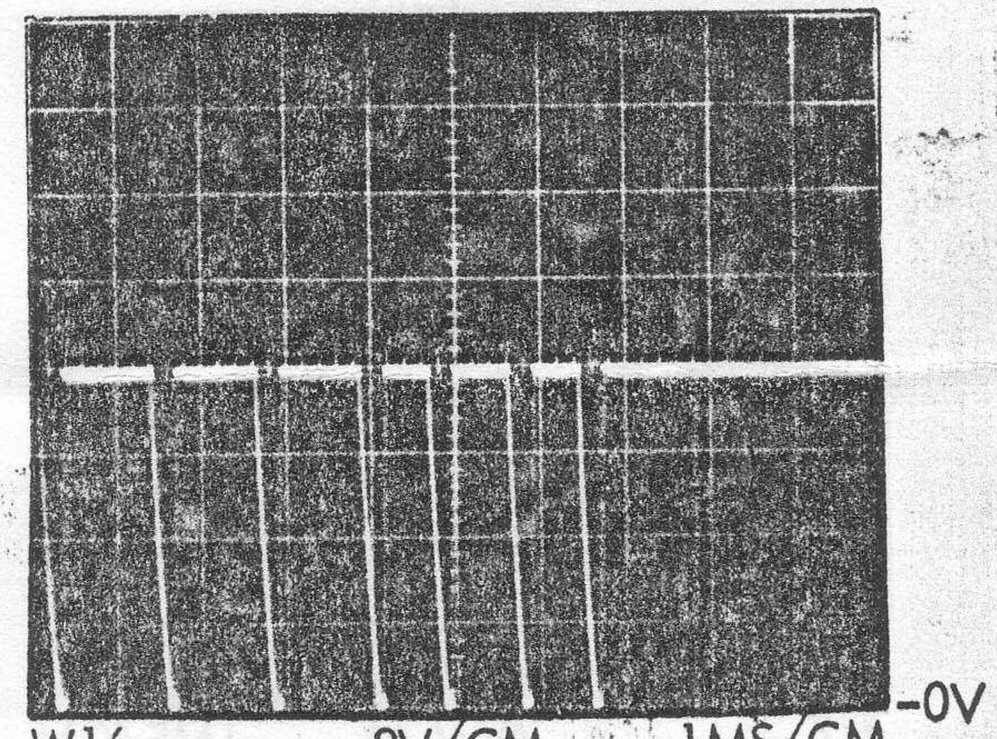

W14 2V/CM 1MS/CM

Collector of Q7 - one shot on-time (approx. 200 M. Sec.)




W15 2V/CM 1MS/CM

Cathode of Steering diode D8




W16 2V/CM 1MS/CM

Collector of Q8 - output of one shot to buffer stage.