MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Sections of the manual are often printed at different times, so some of the information on the change pages may already be in your manual. Since the change information sheets are carried in the manual until ALL changes are permanently entered, some duplication may occur. If no such change pages appear in this section, your manual is correct as printed.

TEXT CORRECTION

Section 1 Specification

Page 1-4 TABLE 1-4 CONVERGENCE PATTERN SIGNAL ELECTRICAL CHARACTERISTICS

CHANGE: Pulse Amplitude to read:

77 IRE within 3 IRE

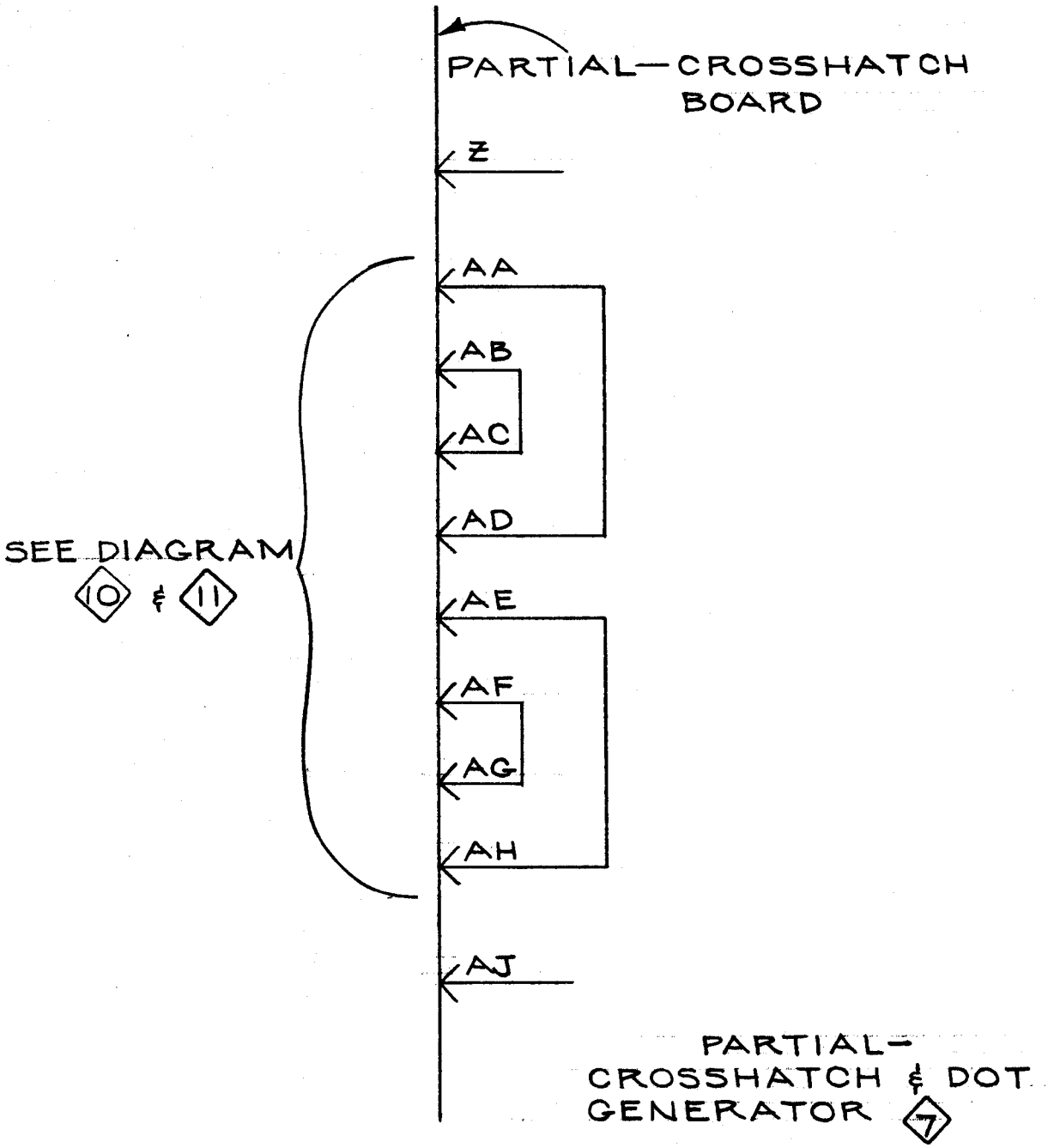
DELETE: Amplitude (overall) 1 volt peak to peak within 5%

TYPE 140/R140

TYPE 144/R144

DIAGRAM CORRECTION

ADD: the following to Diagram (7) .



C9/471

TEXT CORRECTION

Section 7 Electrical Parts List
Page 7-10 Bar Timing Circuit Board
CHANGE: R252 to read: R232

Section 8 Diagrams
Diagram 3 Field Timing
CHANGE: U349 to read: U349A

Diagram 4a Color Bar Drive
CHANGE: R417 should be 5K

Diagram 6b Subcarrier & Sync Source Switching
CHANGE: R62 to read: R64

TEXT CORRECTION

Section 5 Performance Check/Calibration

Page 5-33 Part v of step 24. Check/Adjust Color Bar Luminanace Levels

CHANGE: part v to read as follows:

v. Set the Type R140 COLOR BAR AMPL switch to 100% and the SETUP switch to 7.5%.

Page 5-33 Table 5-4

CHANGE: V_2 Volts control Tolerance (±1%) column for $Blue^7$ and Red^7 to read as follows:

1-2-33 to 1-2-64

2-1-46 to 2-1-90

TEXT CORRECTION

The Type 140 and Type 144 NTSC TEST SIGNAL GENERATORS are equipped with 5 and 10 step staircase test signal capability. The Bar Timing and Staircase circuit boards (670-0302-00 and 670-0305-00) have been replaced by new Bar Timing and Staircase circuit boards (670-0302-02 and 670-1347-00). The following information and changes must be used with your Type 140 and Type 144 Manuals.

Section 1 Specification
Page 1-2,3 Table 1-1
CHANGE: as follows:

TABLE 1-1

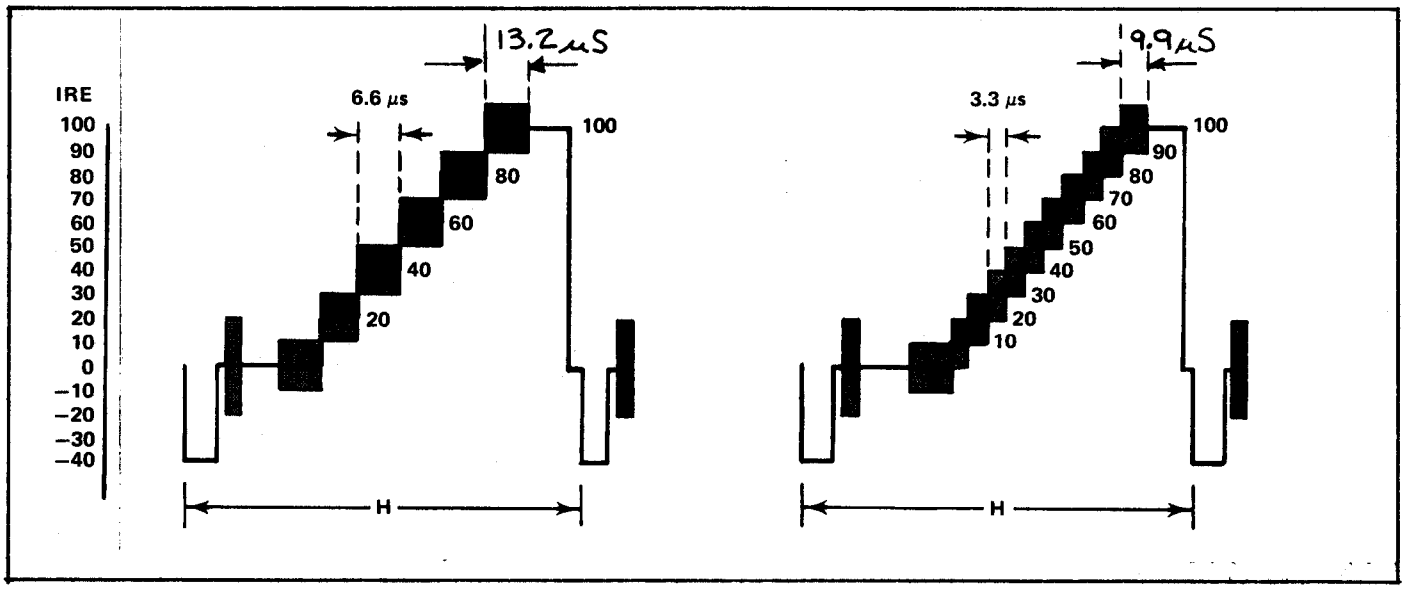
STAIRCASE SIGNAL ELECTRICAL CHARACTERISTICS

Characteristic	Performance Requirement
Luminance Component	
Step Amplitude	
5 Step	143 mV within 1%
10 Step	71.5 mV within 3%
Overall	714 mV within 1%
Step Risetime	260 ns within 15%
Aberrations	Within 2% of step amplitude
Step Duration	
5 Step	
Blanking Level	13.2 µs within 5%
White Level	13.2 µs within 5%
Intermediate Levels	6.6 µs within 5%
10 Step	
Blanking Level	13.2 µs within 5%
White Level	9.9 µS within 5%
Intermediate Levels	3.3 µs within 5%

Chrominance Component	
Amplitude	143 mV within 3%
Differential Phase	
10%, 50% and 90% APL	0.1° or less
Differential Gain	
10%, 50% and 90% APL	0.5% or less
Subcarrier Envelope	
Risetime	400 ns within 15%
Duration	40 µs within 5%
Delay From Line Sync	16.1 µs within 5%
APL	APL specifications conform to IRE Standard 60-23S1
Fixed	All active lines carry the modulated staircase signal with APL fixed at 50% (5 step only)
Selectable	11 levels, equal within 2% Staircase signal is on every fifth line and the same line each frame. The IRE Level of the other four lines can be selected from 0 IRE (10% APL) to 100 IRE (90% APL) in ten equal increments
Subcarrier Component	
OFF	No subcarrier
UNMOD	30 mV within 5 mV (approximately 5 IRE units at 90°) during active line time of 52.3 µs.
MODULATED SUBCARRIER	30 mV within 5 mV for the first and last 13.2 µs of active line time
	286 mV within 3% (40 IRE) for the second 13.2 µs of active line time
	572 mV within 3% (80 IRE) for the third 13.2 µs of active line time Incidental phase errors between 286 mV (40 IRE) and 572 mV (80 IRE) signals are 0.5° or less

Basic Information

The full field modulated staircase test signals are illustrated in Fig. 1. Each is modulated by the subcarrier (3.579545 MHz). The steps are equally spaced between black level and white level.



5 Step Staircase 10 Step Stiarcase

Fig. 1. Idealized oscilloscope display (H rate) showing characteristics of the modulated staircase test signal displays.

Selection of 5 or 10 Step Staircase

Selection of 5 step (factory connected) or 10 step is determined by the positioning of a two (2) connector holder (jumper) on the staircase circuit board. Refer to Fig. 2 for positions used in selecting 5 or 10 step staircase.

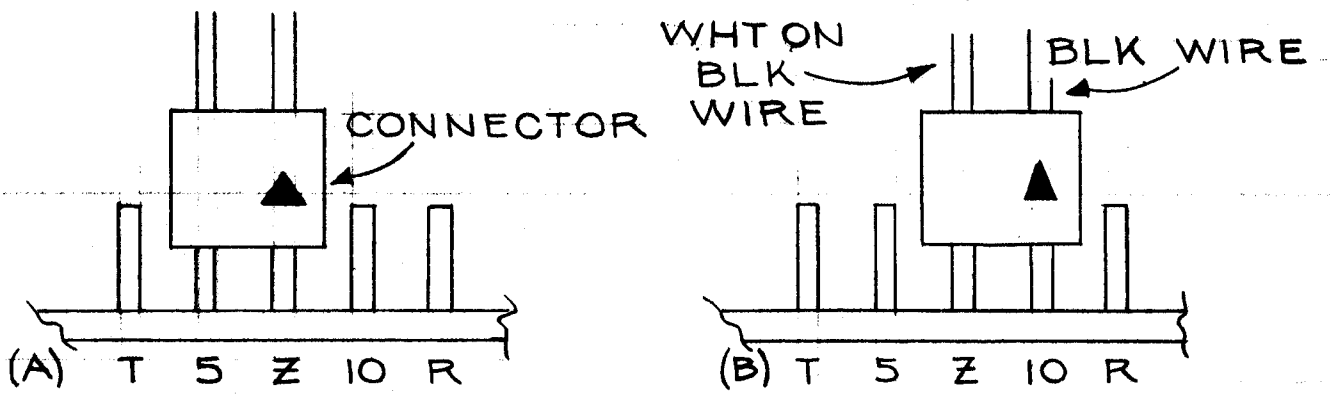


Fig. 2. Partial view of Staircase board (670-1347-00) showing (A) 5 step connection and (B) 10 step connection.

Circuit Boards

Staircase: Existing photos of the Staircase circuit board (670-0305-00) in the existing Type 140 and Type 144 Manuals should be replaced with circuit board shown in Fig. 3.

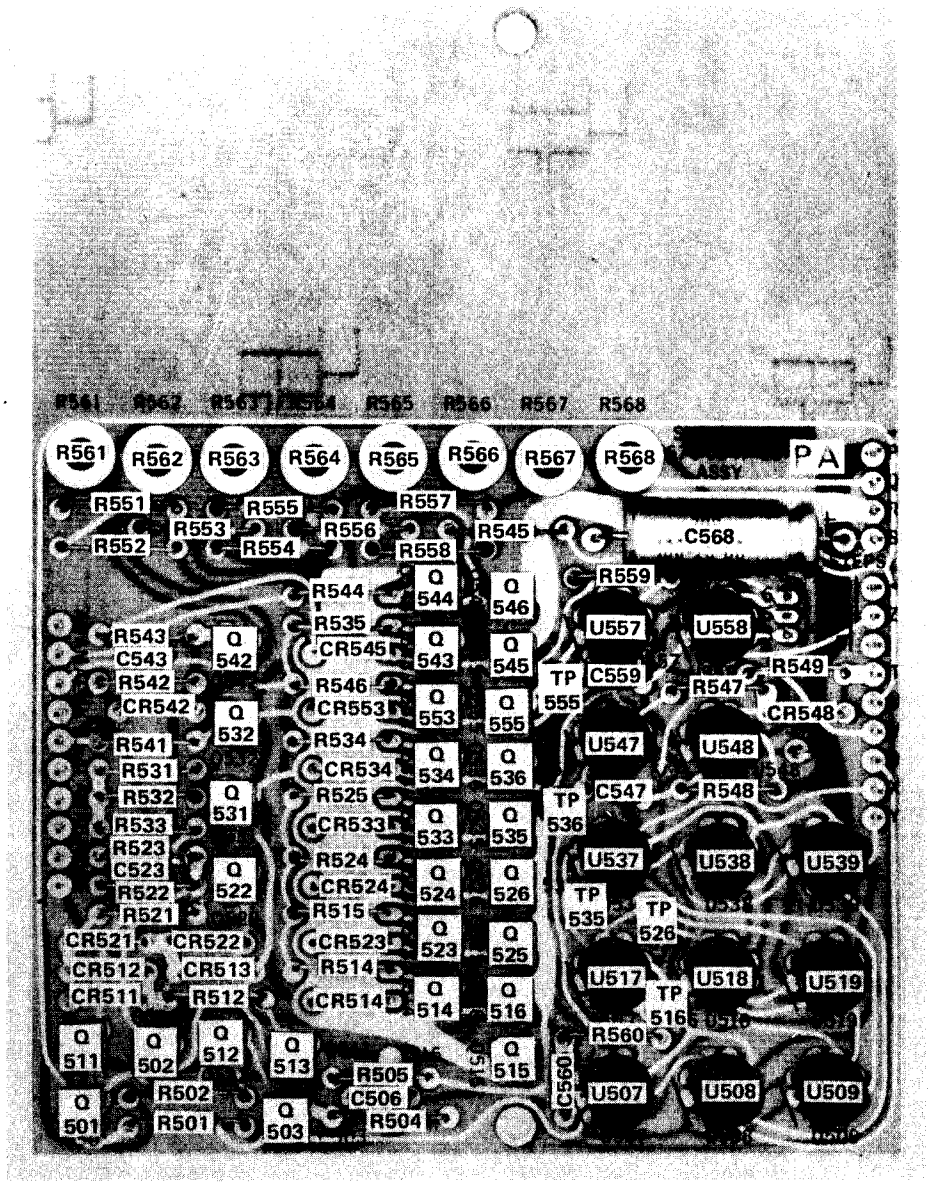


Fig. 3. Staircase circuit board (670-1347-00).

Bar Timing: The Bar Timing circuit board (670-0302-02) is identical to the 067-0302-00 circuit board with the following exceptions:

(1) Addition of Pin BS and circuit board run.

(2) Addition of R212.

These additions are shown on the partial diagrams in this insert.

Performance Check/Calibration

The following changes must be made to the existing Performance Check/Calibration procedures now used for the Type 140 and Type 144 generators. Unless stated otherwise, calibration is performed with the 5 STEP STAIRCASE.

Section 5 Performance Check/Calibration
Page 5-25 067-0596-00 control settings
CHANGE: V1 and V2 Volts controls to read 2-8-70.

Page 5-26 Step 18 Check/Adjust Chrominance Amplifier
CHANGE: parts i and j to read:

i. CHECK--067-0596-00 Calibration fixture V2 Volts control dial setting; must be between 2-8-18 and 2-9-27 (572 mV, ±1%).

j. Set the 067-0596-00 Calibration fixture V2 Volts control for a dial setting of 2-8-70 (572 mV).

Page 5-26 Step 19 Check APL Subcarrier Modulation Amplitude
CHANGE: part h to read:

h. CHECK--067-0596-00 Calibration fixture V2 Volts control dial setting; dial setting must be between 0-2-50 and 0-3-50 (30 mV, ±5 mV).

Page 5-27 Step 19 (cont)
CHANGE: as follows:

q. CHECK--067-0596-00 Calibration fixture V2 Volts control dial setting; dial setting must be between 0-2-50 and 0-3-50 (30 mV, ±5 mV).

r. Set the 067-0596-00 Calibration fixture V2 and V1 Volts controls for dial settings of 1-4-35 each (286 mV).

t. CHECK--067-0596-00 Calibration fixture V2 Volts control dial setting; dial setting must be between 1-3-48 and 1-5-21 (286 mV, ±3%).

u. Set the 067-0596-00 V1 and V2 Volts controls for dial settings of 2-8-70 each (572 mV).

w. CHECK--067-0596-00 Calibration fixture V2 Volts control dial setting; dial setting must be between 2-6-99 and 3-0-42 (572 mV, ±3%).

Page 5-39 Step 32 Check/Adjust Staircase Level Amplitudes

CHANGE: Proceed as follows:

1. Perform parts a through ab (pages 5-39 to 5-41).
2. Remove the top dust cover from the generator under test.
3. Change the positioning of the 2 connector holder (see Fig. 2 of this insert) to the 10 step position.
4. Using Table 1, check all staircase levels listed.

TABLE 1

Generator Under Test		067-0596-00 Control Settings	
Step Number	Step Amplitude	For Step Amplitude	Allowable Error
1	71.5 mV	0-7-17	0-6-95 to 0-7-38 (± 3%)
2	143.0 mV	1-4-35	1-3-82 to 1-4-87 (± 3%)
3	214.5 mV	2-1-52	2-0-87 to 2-2-17 (± 3%)
4	286.0 mV	2-8-70	2-7-84 to 2-9-56 (± 3%)
5	357.5 mV	3-5-91	3-4-83 to 3-6-98 (± 3%)
6	429.0 mV	4-3-10	4-1-79 to 4-4-40 (± 3%)
7	500.5 mV	5-0-25	4-8-76 to 5-1-78 (± 3%)
8	572.0 mV	5-7-47	5-5-76 to 5-9-17 (± 3%)
9	643.5 mV	6-4-67	6-2-72 to 6-6-60 (± 3%)
10	714.0 mV	7-1-72	7-0-99 to 7-2-45 (± 1%)

5. Using Fig. 3 of this insert as a guide, CHECK or ADJUST the staircase levels for 71.5 mV, ± 3% listed in Table 2. Step 10 must be 714.0 mV, ± 1%.

TABLE 2

Generator Under Test		067-0596-00	ADJUST or Check
Step Number	Step Amplitude	V2 Volts Setting	See Fig. 3
1	71.5 mV	0-7-17	R562
2	143 mV	1-4-35	R568
3	214.5 mV	2-1-52	R563
4	286.0 mV	2-7-84 to 2-9-56	CHECK ONLY
5	357.5 mV	3-5-91	R564
6	429.0 mV	4-1-79 to 4-4-40	CHECK ONLY
7	500.5 mV	5-0-25	R565
8	572.0 mV	5-5-76 to 5-9-17	CHECK ONLY
9	643.5 mV	6-4-67	R566
10	714.0 mV	7-0-99 to 7-2-45	CHECK ONLY

6. Change the positioning of the 2 connector holder to the 5 step position. Replace the top dust cover.

7. Perform part am of step 32.

ELECTRICAL PARTS LIST AND SCHEMATIC CORRECTION

BAR TIMING Circuit Board Assembly

CHANGE TO:

670-0302-02 Complete Board

ADD:

R212	315-0470-00	47 Ω	1/4 W	5%

STAIRCASE Circuit Board Assembly

CHANGE TO:

670-1347-00 Complete Board

Q516	151-0225-00	Silicon	2N3563
Q525	151-0225-00	Silicon	2N3563

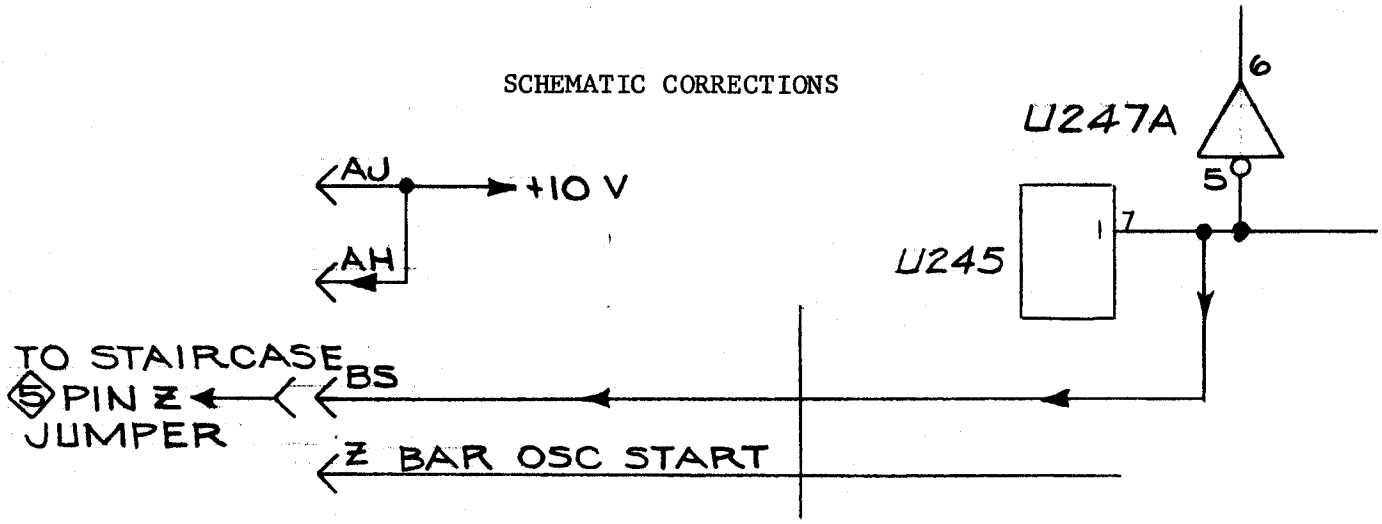
CHANGE TO (cont.):

Q526	151-0225-00	Silicon		2N3563	
Q535	151-0225-00	Silicon		2N3563	
Q536	151-0225-00	Silicon		2N3563	
Q542	151-0225-00	Silicon		2N3563	
Q545	151-0225-00	Silicon		2N3563	
C568	290-0215-00	100 µF	EMT	25 V	
R502	321-0337-00	31.6 kΩ	1/8 W		1%
R504	321-0680-00	35.3 kΩ	1/8 W		±1/2%
R551	321-0326-00	24.3 kΩ	1/8 W		1%
R552	321-0356-00	49.9 kΩ	1/8 W		1%
R562	311-0836-00	5 kΩ, Var			

ADD:

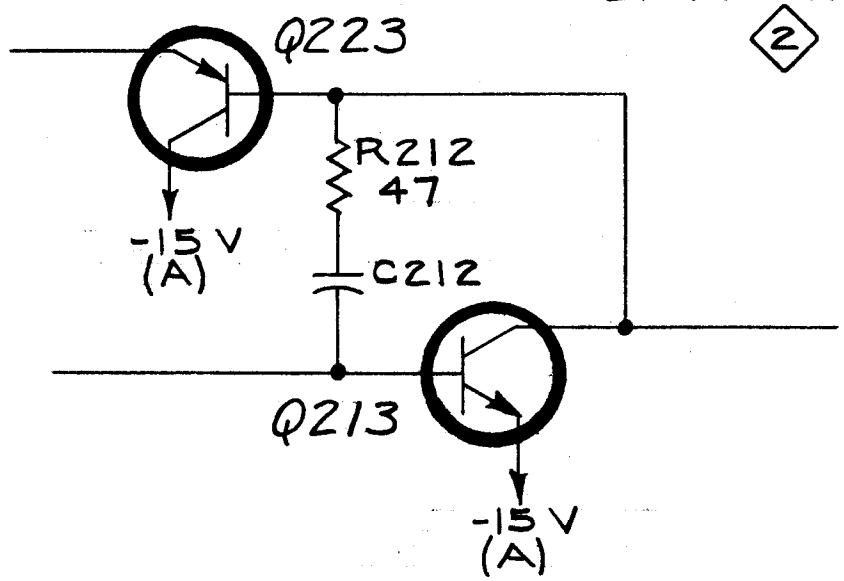
C559	283-0060-00	100 pF	Cer	200 V	5%
C560	283-0060-00	100 pF	Cer	200 V	5%
CR553	152-0185-00	Silicon	Replaceable by 1N4152		
Q553	151-0193-00	Silicon	Replaceable by MPS6521		
R546	315-0101-00	100 Ω	1/4 W		5%
R558	321-0356-00	49.9 kΩ	1/8 W		1%
R559	315-0102-00	1 kΩ	1/4 W		5%
R560	315-0102-00	1 kΩ	1/4 W		5%
R568	311-0836-00	5 kΩ, Var			
U557	156-0011-00	Integrated Circuit	Medium Power, Dual 2-Input Gate Replaceable by Fairchild µL9914		
U558	156-011-00	Integrated Circuit	Medium Power, Dual 2-Input Gate Replaceable by Fiarchild µL9914		

SCHEMATIC CORRECTIONS



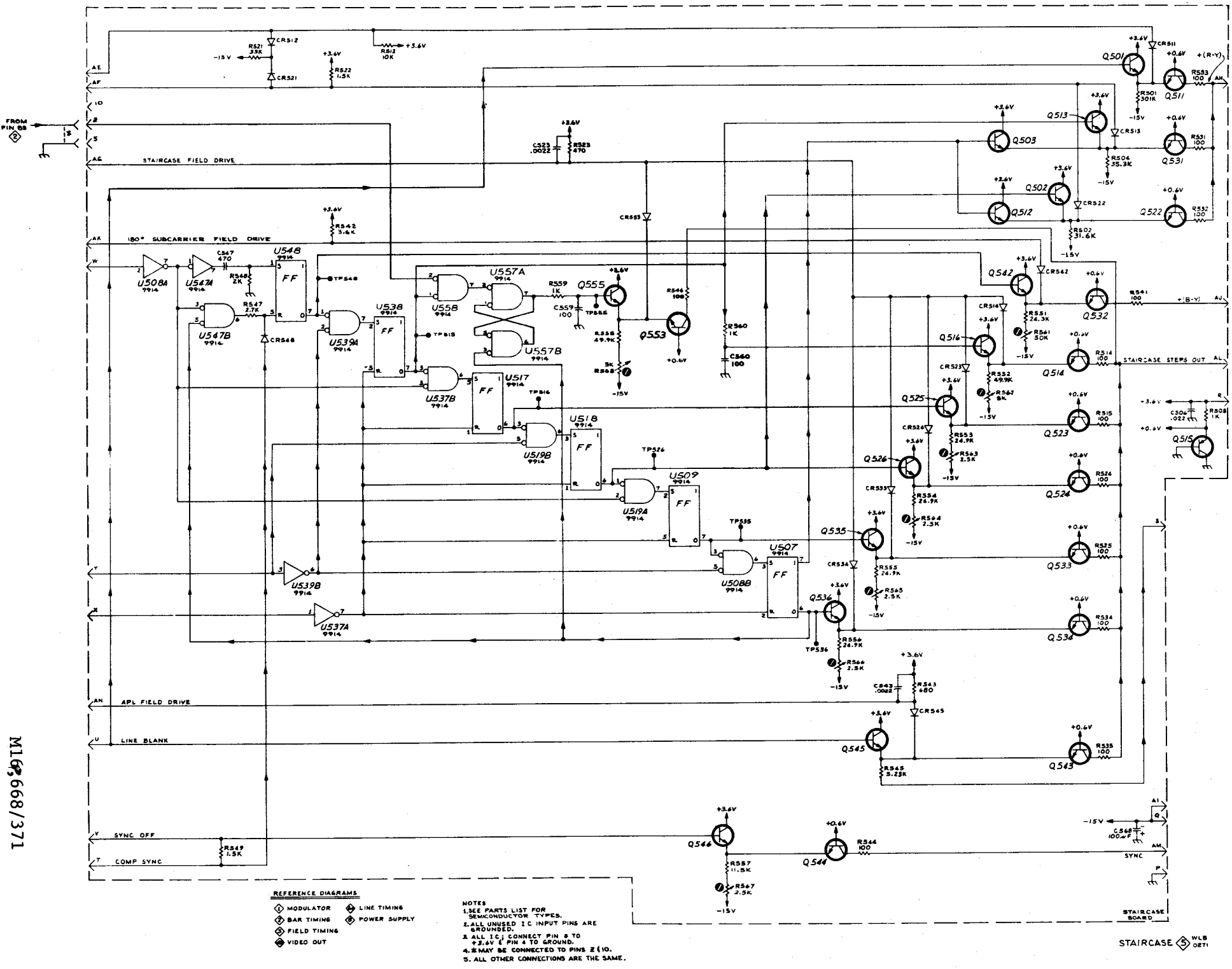
NOTE: ALL OTHER PIN CONNECTIONS REMAIN THE SAME

PARTIAL—BAR TIMING
2



NOTE: Bar Timing (670-0302-02) is identical to Bar Timing (670-0302-00) except as shown.
All other components remain the same.

TYPE 140/R140 TENT SN B120000-up
TYPE 144/R144 TENT SN B080000-up



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140/R140 TENT SN B130000-up

ELECTRICAL PARTS LIST CORRECTION

POWER SUPPLY Circuit Board Assembly

CHANGE TO:

Q815	151-1004-00	FET	Silicon	N Channel-Junction Type
Q830	151-0103-00		Silicon	Replaceable by 2N2219

140/R140 TENT SN B140000-up

142/R142 TENT SN B040000-up

144/R144 TENT SN B100000-up

146/R146 TENT SN B040000-up

ELECTRICAL PARTS LIST AND SCHEMATIC CORRECTION

POWER SUPPLY — Circuit Board Assembly

REMOVE:

C816	283-0000-00	0.001 µF	Cer	500 V